PEARSON ADAIR & CO.

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF NORTH DAKOTA
WESTERN DIVISON

Newfield Production Company,	)	
	)	Case No. 1:16-cv-273
Plaintiff,	)	
v.	)	
	)	**EXPERT REPORT OF LESA S. ADAIR**
Eighty-Eight Oil, LLC	)	
	)	
Defendant.	)	

Lesa S. Adair
August 11, 2017

Exhibit J

Table of Contents

INTRODUCTION

1. Eighty-Eight Oil, LLC ("EEO") retained Pearson Adair & Co. ("Pearson Adair") to render expert opinions related to certain claims made by Newfield Production Company, ("Newfield") et al., in this matter. EEO was established in 1963 and provides crude oil marketing and logistics services to participants with interests along the crude oil value chain. EEO entered into a Crude Oil Volume Commitment Sale Agreement with Newfield in late-2011 (the "Agreement").[1]

2. The opinions offered in this report are based on the data produced by EEO and Newfield in the course of this proceeding, publicly-available data and information, my education, and experience gained from working for more than 30 years in the oil and gas industry. My qualifications and publications are attached as Appendix A. I co-founded Pearson Adair in 2016 and am currently a Partner of the firm. I am a licensed professional engineer and have a B.S. in Chemical Engineering and an M.B.A. with a concentration in Finance.

3. My expertise is in the areas of chemical engineering, crude oil, natural gas, and natural gas liquids (NGL) production, processing, storage, and marketing, as well as oil and gas business management, profitability, transactions, transactional due diligence, and marketing practices. A listing of my expert testimony by deposition or trial within the last four years is attached as Appendix B. A complete listing of the documents and data that I reviewed in forming my opinions is provided in Appendix C. Pearson Adair is being compensated at a rate of $495 per hour for my work in this matter. This compensation is not dependent in any way upon the outcome of this litigation.

4. I expect to offer expert testimony in the captioned matter concerning those opinions described below as well as the opinions offered by other experts in this matter. I understand that document and deposition discovery in this case continues and I reserve the right to

[1] See Confidential Eighty-Eight 0001933 to 1939.

supplement or amend this disclosure based upon additional information obtained as discovery proceeds.

SUMMARY OF CONCLUSIONS

5. Based upon the information available and reviewed by me or my staff to date, as well as my education, training, and experience in the oil and gas industry, I have formed certain opinions, principal among those being that:

    a. The contract and pricing terms agreed to by EEO and Newfield in the Agreement were commercially reasonable given the market expectations at the time the contract was negotiated.

    b. As a measure of the difference in value between crude oil delivered in Cushing, Oklahoma, and crude oil delivered and sold to EEO at or near the lease in North Dakota, but for which EEO incurs costs associated with the delivery and sale of the volumes to multiple outlets outside of North Dakota, Eighty Eight's differential for NDL (North Dakota Light) should assess the revenue and the associated cost to consummate sales of North Dakota-produced crude oil to multiple outlets outside of North Dakota.

    c. If Eighty Eight's differential for NDL were to include only the revenue earned from sales that occur at locations downstream of the lease and to multiple sales locations outside of North Dakota, without recognition of the costs to transport and deliver the North Dakota crude to those locations, the NDL differential would represent the assessment of the market value of North Dakota crude sold in other locations, but not the value of North Dakota crude sold in North Dakota at or nearby to the wellhead.

    d. Inclusion of all of EEO's agreements in the assessment of Eighty Eight's differential for NDL would skew reality as volumes purchased for delivery under related, dedicated downstream sales commitments were solely attributable to the party delivering the specific barrels to EEO, and therefore cannot be part of Eighty Eight's differential for NDL or any other aggregated pool of EEO business. The overall prices paid Newfield

for crude deliveries to EEO under the Agreement were competitive with other market prices for crude oil sold and delivered at or near the wellhead in North Dakota over the duration of the Agreement.

e. The $0.85-per-barrel marketing fee agreed to by the parties was described by Newfield's crude marketing manager, Charles Laudeman, who negotiated the contract with EEO, as the recognized profit margin for EEO in the deal;[2] as such, Newfield knew or should have known that any costs attributable to crude oil sales included in Eighty Eight's differential for NDL would be borne by Newfield.

f. The overall prices paid Newfield for crude deliveries to EEO under the Agreement were competitive with other market prices for crude oil sold and delivered at or near the wellhead in North Dakota over the duration of the Agreement.

g. Mr. Pulliam's Damages Based on Contract Price relies upon his own alternative NDL differential which misrepresents the value of NDL crude.

h. Mr. Pulliam's Damages Calculation Using Market Prices relies upon his attempt at an "average market price" that does not represent a price that should have been paid by EEO to Newfield under the contract.

i. One measure of the potential value for alternative crude dispositions in the past is analyses of crude purchase offers made to the producer at the time, but not accepted by the producer. Only bona fide offers from creditworthy counterparties who had demonstrated abilities to perform under such contracts could be considered as validation that alternative sales could have been consummated at the time.

BACKGROUND – THE CRUDE OIL VALUE CHAIN

6. The crude oil value chain consists of three distinct segments: upstream, midstream, and downstream. Activities in the upstream segment are focused on the exploration for, and the

[2] See Deposition of Charles Laudeman, May 10, 2017, Page 158, lines 22-25 to Page 160, lines 1-6.

production of, crude oil located in naturally-occurring, underground accumulations. Ultimately, the demand for hydrocarbons at the wellhead is derived from the downstream industries that utilize oil and/or condensate as feedstock or fuel. Wellhead volumes are separated, gathered, stored, and distributed through the midstream segment to meet downstream market demands. Between the wellhead in the upstream and consumers in the downstream, value is added to the produced hydrocarbon components in the midstream sector as components are separated, aggregated, transported, and distributed to meet the demands of consumers worldwide.

7. Many producers operate wells that produce both oil and gas. So-called, "oil wells" generally produce primarily oil with water and some gas, while "gas wells" produce primarily gas, with some condensate and water. A wide range of well production scenarios exist, with wells in some locations producing primarily condensate at surface conditions.

8. Given the physical characteristics of oil and gas, as well as common oil and gas by-products, the midstream segment of the value chain provides services necessary to monetize reserves based on the characteristics of each producing area and the requirements of the downstream markets served. Midstream companies gather, aggregate, store, condition, process and distribute oil, gas, condensate, natural gas, and NGL providing the vital link between geographically dispersed supply points in the upstream and hydrocarbon consumers worldwide.

9. The downstream segment includes a diverse range of consumers. Crude oil and condensate are primarily delivered to downstream consumers by pipeline. However, depending on specific quality characteristics, producing location, and daily production volumes, these liquid hydrocarbons are typically transported by truck, rail, barge, or ocean-going tanker.

10. Crude oil and condensate are aggregated in the midstream, primarily for delivery to refineries for the production of fuels, lubricants, and specialty chemicals. Not every refinery can utilize every available grade of crude oil, therefore refiners seek out suppliers who can aggregate and deliver large volumes of hydrocarbons that "fit" the requirements of their specific

refining facilities. Most refineries can utilize some condensate; although refineries are generally designed to operate on a blend of crude oil streams rather than solely a blend of condensate streams.

CRUDE OIL PRODUCTION

11. Crude oil is a commodity that is traded worldwide. However, the characteristics of crude oil vary significantly and can even vary from well to well within the same producing field or area. As crude oil is gathered and aggregated into tankage or pipeline systems, crude oil streams from individual wells are combined into batches and/or common pipeline streams.

12. Individual common streams are categorized based on quality and producing region. Crude "grades" are utilized by buyers and sellers to identify and classify supply. According to Argus, approximately 550 global crude oil streams are identified as individual crude grades with a multiplicity of qualities and prices.[3] In the marketplace, crude oil streams are defined by hydrocarbon product yield to the refiner (i.e., light or heavy), content of impurities (i.e., sweet or sour), and producing region (i.e., West Texas or North Dakota). The relative value of one crude grade to another at a specific delivery location is often assessed based on these characteristics, however, other market factors also influence negotiated prices for crude transactions.

CRUDE OIL PRODUCING INFRASTRUCTURE

13. Oil production typically flows or is pumped to the surface with associated natural gas and water. The expected volumes of associated gas and/or water for any particular well are unique and often vary over the producing life of the well. Field facilities typically separate produced oil or condensate from associated gas and produced water. As the oil, gas, and water are separated, the oil and water are stored in tanks installed nearby to the producing well or wells (if multi-well drilling pads are utilized) or at central delivery locations, so-called central delivery points or "CDPs" located within or near to the geographic area of the

[3] See *Trading and Clearing the Argus Sour Crude Index ("ASCI") with ICE PRODUCT GUIDE,* https://www.theice.com/publicdocs/ICE_ASCI_Product_Guide.pdf*., Page 1.*

producing field. Depending on the volume and quality of the associated gas, pipeline gathering may be available from the CDP or the gas may be consumed in lease operations.

14. Oil inventories build up in field storage facilities and are transported from the producing field by pipeline, truck, rail, or marine vessel depending on the availability of installed equipment, the capacity of the installed equipment relative to the produced volumes, and the marketing arrangements at any given time over the lifespan of the producing wells. Oil is transported away from the producing area to regional trading centers where supplies of oil are aggregated prior to injection into mainline transmission pipelines or loading into rail cars or barges for transport to refiners.

THE CRUDE OIL MARKET

15. Merriam-Webster defines a market as "the area of economic activity in which buyers and sellers come together and the forces of supply and demand affect prices."[4] Crude oil is traded in the worldwide marketplace with physical supplies of crude oil transported to meet demand in refineries located thousands of miles from producing wells. For example, crude is produced in Saudi Arabia and delivered by ocean-going tankers to refineries on the U.S. Gulf Coast. Oil sands in western Alberta are processed to recover heavy oil that moves by pipeline and rail car to refineries on the U.S. Gulf Coast. Brent Sea production is delivered by tanker to refineries located in Europe and Atlantic Basin refineries, such as those located near Philadelphia. Crude oil produced in North Dakota is transported by rail car to refineries located on the Mississippi River, in California, or on the U.S. East Coast.

16. Within the global crude oil market, active regional markets exist at locations where buyers and sellers interact to purchase and sell locally-produced supplies of crude. Regional markets provide physical liquidity as well as price discovery and transparency. Crude oil producers and marketers transport physical crude from individual well locations or CDPs in or near the producing field to regional market centers where volumes are aggregated for sale to meet demand for downstream supply. Price reporting services canvas market participants, gather

[4] See www.merriam-webster.com/dictionary/market.

actual transaction prices, analyze the transaction data, and then report anonymous summary pricing information back to market participants.

17. Marketing companies aggregate crude oil supplies from multiple wells, multiple producers, and multiple producing fields or "pools." These midstream companies then utilize a portfolio of owned and leased transportation assets to efficiently deliver physical crude oil supplies to other marketers serving refiners or directly to refiners to meet demand requirements in the downstream sector. The aggregation of crude production at or near the wellhead can often improve transportation economics relative to single well transportation economics, especially as production rates decline over time. By combining volumes at or near the wellhead, marketers optimize transportation and storage assets such as trucks, rail cars, and reserved pipeline capacity on a large scale, resulting in higher asset utilization, reduced demurrage, and more efficient utilization of personnel.

18. Volume aggregation also provides downstream users with access to greater liquidity for higher-volume supply contracts at market centers more directly accessible to refining facilities. Thus, refiners are able to secure adequate supplies with fewer contracts reducing the administrative burden associated with negotiating, scheduling, and accounting for crude oil purchases.

CRUDE OIL PRICE

19. Prices for the wide variety of crude grades available for purchase and sale are observed in markets around the world and are widely reported on a daily basis. However, only a handful of the grades trade in sufficient volume and provide sufficient price visibility to be classified as "benchmark" or "marker" crude grades.[5] The remainder of the crudes are priced based on differentials to the few recognized, key benchmark crude prices.[6]

[5] See *Trading and Clearing the Argus Sour Crude Index ("ASCI") with ICE PRODUCT GUIDE,* https://www.theice.com/publicdocs/ICE_ASCI_Product_Guide.pdf*., Page 1.*
[6] Ibid.

20. In the U.S., marker crudes for light sweet crude grades include (1) West Texas Intermediate ("WTI") delivered at Cushing, Oklahoma, (2) Light Louisiana Sweet ("LLS") delivered at St. James, Louisiana, and (3) "dated" Brent loaded during a given date window into tankers in the North Sea for delivery to the U.S. and other world markets. Physical volumes of all three of these crude grades potentially compete directly for market share with other light sweet crudes sourced from various locations throughout the U.S., and with crude supplies imported from foreign sources, to meet demand in the U.S. refining sector. Historical spot prices for these three marker crude grades are shown in Figure 1 below.

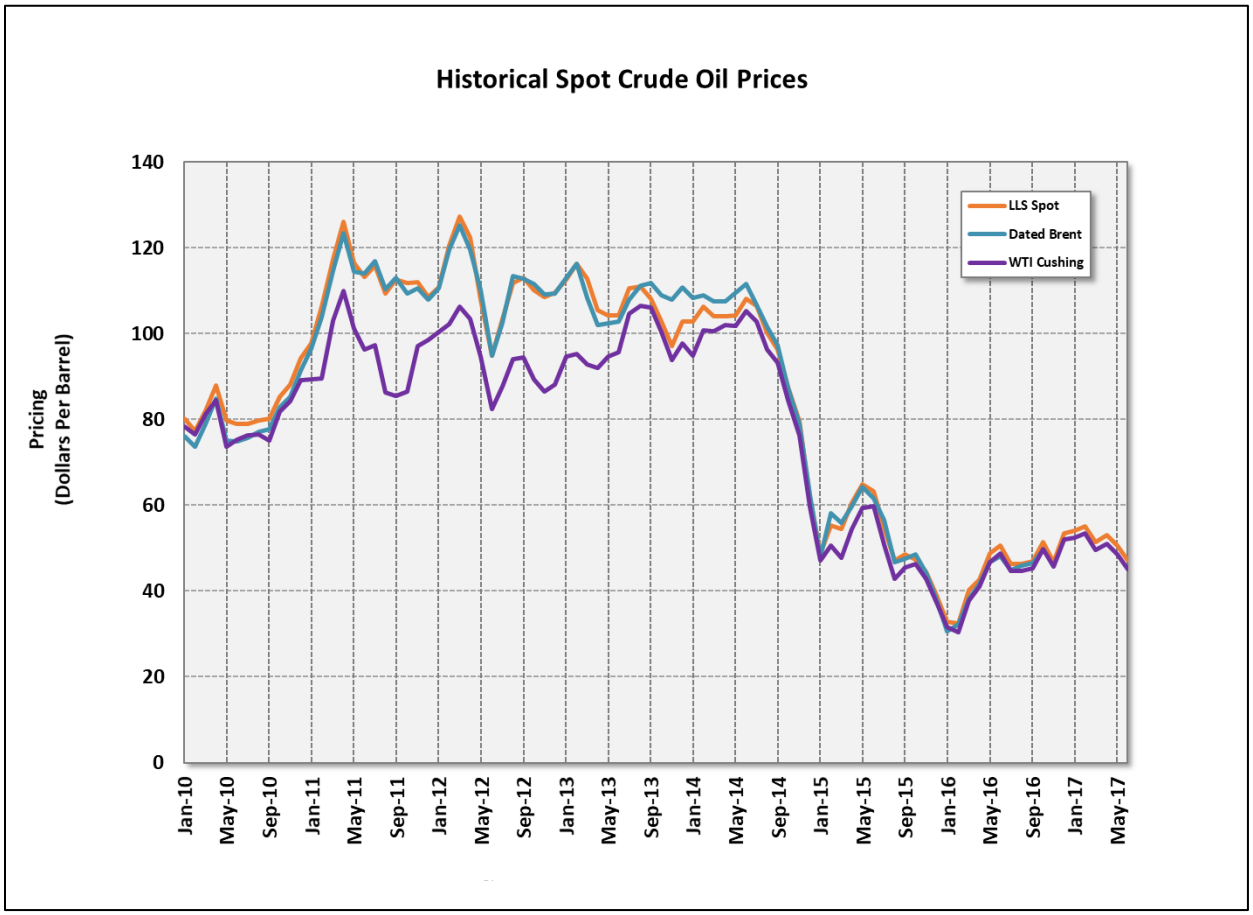

Figure 1: Historical Spot Crude Oil Prices

Sources: Platts U.S. Crude Oil Assessments and Energy Information Administration

21. Crude oil grades that vary in quality from marker crudes, and/or that are sold in locations other than the market center hubs where the prices for marker crudes are published, are often priced relative to the marker crude prices based on price differentials. Thus, light sweet

crude oil produced for sale in North Dakota and in many other locations is routinely sold on a "WTI net differential" pricing basis. The pricing differential may be positive or additive to the base WTI marker prices, or negative thus reducing the base WTI marker price to arrive at the settlement price agreed to by the contract parties. The differential may also be fixed for the term of the purchase and sale agreement, or the differential may be a floating value determined from month to month throughout the term of the contract.

22. Spot trading differentials for crude grades that are not marker crudes may vary daily and over time based on many market factors including, but not limited to the following:

    a. Local supply/demand at or nearby the trading location

    b. Logistics considerations for transport of the subject crude stream to the market center trading location including availability of capacity and total transit time incurred

    c. Inventory limitations/requirements or batch size considerations necessary to originate pipeline or rail shipments

    d. The absolute price of the marker crude

    e. The terms and conditions of sales for the subject crude that may differ from the terms and conditions of the marker crude at its trading location including site of the transfer, credit requirements, storage requirements, inventory requirements, timing of receipt/delivery, timing of pricing, etc.

23. For example, the historical crude oil differential for WTI Spot Crude Oil at Cushing, Oklahoma, is shown relative to the LLS Spot Crude Oil Price at St. James, Louisiana, in Figure 2 below. In the period from January 2010 to the end of 2016, the price differential between WTI and LLS varied from nearly flat to over $25 per barrel. Other historical price trends and associated differentials relevant to crude oil produced and marketed in North Dakota are provided in Appendix D.

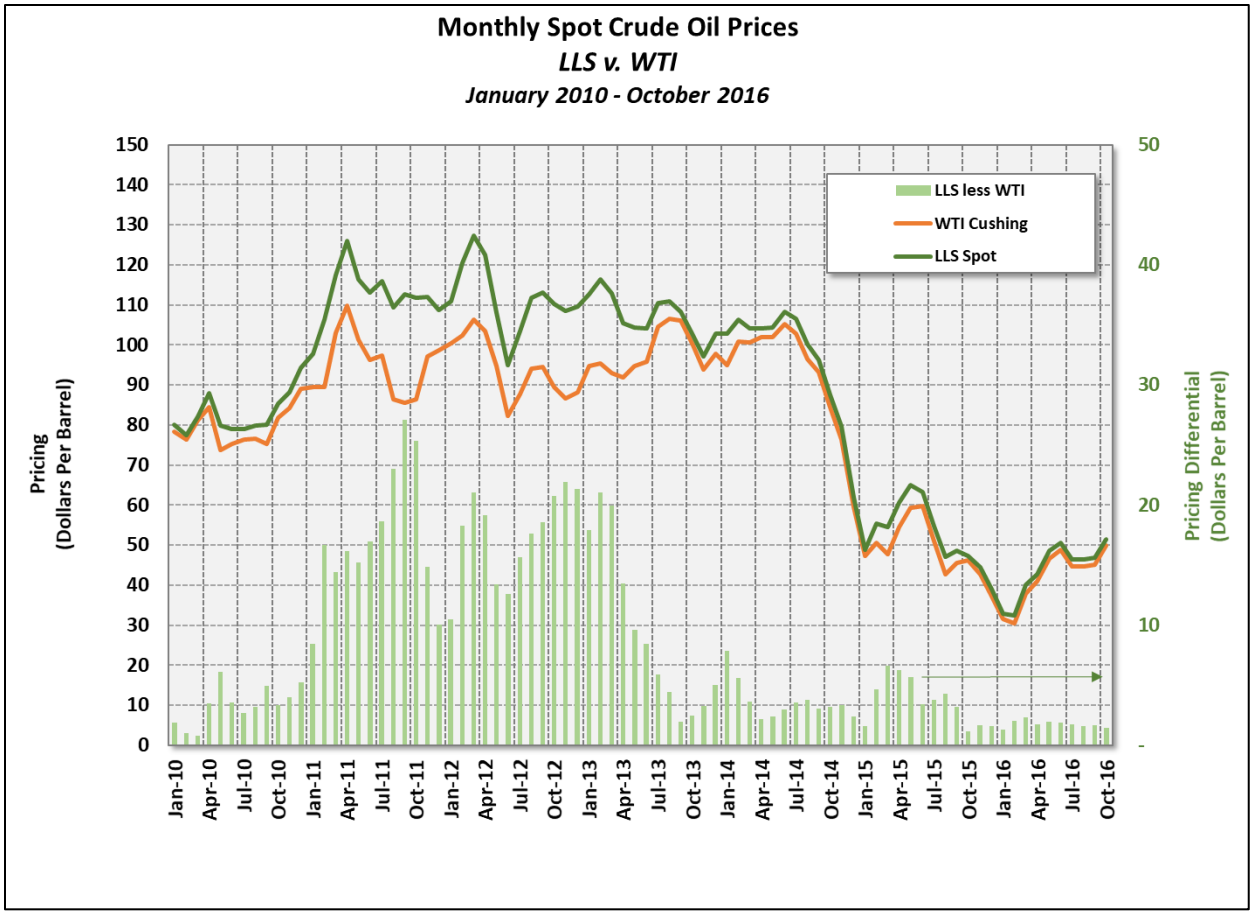

Figure 2: Monthly Spot Crude Oil Prices – LLS v. WTI

Source: Platts U.S. Crude Oil Assessments

CRUDE OIL PURCHASES AND SALES

24. Crude oil is generally produced at the wellhead each day[7] while purchases and sales in the midstream and downstream segments are transacted based on a monthly trading cycle. In the month prior to production and delivery, contracts are negotiated for the transportation, purchase, and sale of the crude oil supplied that are expected to be delivered in the following month. For example, in the month of July, crude marketers and traders are focused on negotiating and executing contracts for crude that will be produced and delivered during the calendar month of August and beyond. As such, the contracting parties exchange offers and

[7] Flowing wells produce as long as the wellhead is open to the producing facilities while wells that require artificial lift produce only when the pump or gas lift mechanisms are operating to move fluids out of the wellbore and to the surface, a process that is on-going, but not necessarily continuous throughout each day.

negotiate the terms and conditions of contracts based on their expectations of what will happen in the coming month or in months or years in the future.

25. Crude oil trading is further complicated by the variety of contracts, pricing formulas, and numerous pricing bases that are utilized by contracting parties. Some of the typical contracts utilized in transacting monthly crude oil marketing and trading include, but are by no means limited to:

    a. Transportation Contracts – Fixed Price to accept crude of a certain grade at a defined location, transportation of the crude and re-delivery of the crude at a defined location over a given time period; may include pricing adjustments or additional fees or price escalators for truck, pipeline, or barge transportation.

    b. Wellhead or Lease Sales, Posted Price - based on "Posted Price" or an average of posted prices with an agreed price differential for the grade delivered.

    c. Wellhead or Lease Sales, Formula Price - based on "Marker Price" for the grade delivered with a differential to reflect the quality, quantity, location, cost and supply/demand of the local lease market relative to the same conditions at the market center. The formula price typically includes an average of the closing prices for the marker crude based on a defined set of trading days.

    d. Trading Location Sales, Fixed, or Formula Prices – based on delivery of aggregated volume of crude with defined quality based on either a fixed price or a formula price as agreed by the trading parties.

    e. Exchanges, Fixed, or Formula Prices – parties agree to exchange physical volumes from one location to another and, in so doing, recognize the difference in current market value and possibly the expected crude qualities associated with one location versus another; the parties' expectations of the overall value difference are included in a single location or basis differential agreed by the trading parties.

    f. Futures Contracts – commodity trading contracts that fix prices for physical deliveries to be completed at some date certain in the future. These contracts that are typically

settled on a "paper" basis, but physical delivery of crude may also be utilized to settle the contract; sometimes referred to as "NYMEX" trades.

26. The terms and conditions for crude oil purchases and sales are typically negotiated verbally, or via electronic communication, and then formally memorialized in written contracts between the parties. These contracts routinely address the grade of crude oil, crude oil price or pricing formula, expected delivery volume, duration of the delivery, location of the delivery, delivery confirmation and scheduling, contract primary term, contract termination requirements, measurement requirements, invoicing, payment terms, credit requirements, risk of loss, as well as any specific fees or unique terms and conditions agreed to by the parties. Although purchase and sale agreements often contain similar terms and conditions, the private contracts negotiated between buyers and sellers can, and do, take a wide variety of different forms

27. The agreed crude oil price or pricing formula is based on the expectations of the parties at the time the contract is negotiated. Factors that the parties may consider when negotiating contract prices include the following:

    a. Grade of the crude and quality at delivery

    b. Location of the crude on delivery

    c. Contract Price or Price Formula

    d. Additional specific fees or costs and allocation of same between buyer and seller

    e. Duration of the contract

    f. Credit worthiness of trading partners

    g. Performance risk factors – operational risk, reserve risk, etc.

    h. General Terms and Conditions of the Sale and Delivery

28. Contracting parties agree to a primary term and duration for each crude oil purchase and sale agreement. Under the terms and conditions of these contracts, crude oil may be delivered for a single month, over multiple months, an entire year, or multiple years. Some agreements

specify a primary term and at the expiration of the primary term, contract deliveries continue on a month-to-month or year-to-year basis, unless cancelled by either party. The primary term and termination conditions are specified in the writing in these contracts.

29. The negotiated contract terms and conditions agreed by the parties, including the duration of the contract, reflect their future expectations regarding such factors as the volume of crude oil available for purchase and sale, the producing location, the delivery location, the availability and type of transportation capacity, and market prices. Such expectations regarding the future are included in each party's assessment of the contract value at the time the contract terms are finalized. The actual contract value realized by any contracting party depends on the actual circumstances encountered during contract performance. For contracts of longer duration, a greater time period exists for potential deviations from the parties' expectations at contract execution and therefore, the greater the possibility that the realized value for either party will deviate from initial expectations.

CRUDE OIL MARKETING COMPANIES

30. The core competency of crude producers is finding and developing oil and gas reserves. Their focus in on mastery of the tools and technology utilized to efficiently find and extract oil and gas for delivery to downstream markets. Some producers also allocate human and capital resources to the midstream sector, while other producers prefer to sell production at, or very near to, the wellhead to midstream crude oil marketing companies like EEO or other purchasers.

31. In the midstream sector, crude oil marketers actively seek out supplies of crude oil at or near the wellhead; manage transportation for the purchased crude oil volumes; and aggregate crude oil for sale at market centers, or further downstream directly to end user refiners. Marketers may also exchange physical volumes of crude oil with others when such exchanges reduce transportation costs or are otherwise beneficial to the management of the company's total crude oil portfolio. Marketers sometimes work directly with specific refiners to identify, purchase, and deliver a crude stream with specific quality characteristics or common stream volumes for delivery via specific transportation mechanisms to support refinery operations.

As such, midstream crude oil marketing companies serve customers who have crude oil available for sale and customers seeking to acquire crude oil supply. Marketers compete with other marketers and purchasers to acquire crude oil supply and to sell their available supply to other purchasers and end users every month.

32. Crude oil marketing companies do not earn returns on the production of oil and gas reserves. Rather, companies in the midstream sector generate revenue and seek to earn profits by providing services such as transportation and storage of crude oil, aggregation of volumes from multiple wellhead or field locations, risk management services, and acquisition of crude supply for the downstream sector. Marketers also manage credit risk, schedule crude oil movements, and own/contract for transportation capacity via truck, pipeline, rail or marine vessel. Crude oil marketers operate "on the margin" between the cost to purchase and transport crude oil from producing regions and the revenues earned from sales to meet downstream demand.

33. Given that the available supply of crude oil from a producing well, field, or region varies from month to month due to normal operating variances, and contracts for the purchase of crude oil may have primary terms that vary from a single month, to multiple months, to a year or more, the portfolio of crude oil purchases and sales for any one midstream company typically varies from month to month. Further, downstream demand from any one refiner or at any market center also varies month to month due to changes in downstream product demands, competing sources of supply, and operational changes/disruptions at points along the value chain. Thus, a midstream crude oil marketing company manages an ever-changing and highly dynamic pool of crude oil purchases and sales during every month of operations.

34. Because crude oil marketers compete to purchase crude oil and compete for downstream sales, detailed information regarding the revenues and costs of running their business are held in strict confidence. This confidentiality extends to the bases for the prices that they offer for purchases and sales, known as "bids" and "asks." As Ms. Deferrari observed, "Each purchaser brings a unique set of components to its bid. So, I can't speak to the specific weighting that each purchaser will put in its bid; but there are multiple components they

probably consider when making their number."[8] and further, "Q: It's not industry standard to tell you as the seller of crude oil what's in the differential? A: It's not industry standard for them to detail exactly what they considered when making their proposed price bid."[9] The proprietary nature of the components considered when parties make bids and asks in the marketplace is a respected norm in the industry, and crude oil marketing companies consider the process by which they formulate bids and asks a well-guarded competitive asset to their businesses. It is not usual and customary in the crude oil marketing sector that the components of pricing that are considered by the parties when a crude oil purchase and sale agreement is negotiated, are disclosed either verbally between the parties during negotiations, or in writing as part of a draft or final written agreement. In addition, the terms and conditions negotiated in purchase and sale agreements are also considered confidential and are not disclosed to other trading partners, suppliers, or downstream customers.

35. In addition, should the parties agree that certain aspects of the purchase and sale agreement be subject to auditing, the terms and conditions of such an audit are agreed by the parties during negotiations and documented in the written contract executed when negotiations are finalized. Auditing rights and limitations such as a defined "look back" period for which accounting source documents and monthly accounting packets must be maintained, procedures for requesting an audit, procedures for reviewing audit materials and the like are routinely agreed by the parties and included within the written purchase and sale agreement.

DEVELOPMENT IN THE BAKKEN REGION

36. Exploitation of the Bakken Formation began with vertical drilling in the 1950s and discovery of the Antelope Field in McKenzie County, North Dakota, in 1953.[10] Development progressed over the decades since that time with advances in drilling and completion technologies

[8] See Deposition of Robin Deferrari, May 25, 2017, Page 22, lines 9-12.
[9] See Deposition of Robin Deferrari, May 25, 2017, Page 23, lines 8-12.
[10] See *A Brief History of Oil Production from the Bakken Formation in the Willison Basin, Nordeng, January 2010,* at https://www.dmr.nd.gov/ndgs/documents/newsletter/nl2010/ABriefHistoryofOilProductionfromtheBakkenFormationintheWillistonBasin.pdf.

leading to the discovery of other productive fields including Elkhorn Ranch in 1961 and various fields in the Bakken Fairway in the 1970s and early-1980s.[11] Meridian drilled the first horizontal well in the region in 1987 and exploitation of the Bakken Fairway with horizontal drilling continued until 2000. In 2005 and 2006, EOG Resources utilized horizontal drilling and large hydraulic fracture stimulation in the Parshall Field and developed wells with initial production rates of more than 500 barrels per day.[12] As fracturing techniques evolved, wells with higher initial production rates were developed in some areas, however, the productivity of individual wells developed in this area is dependent on reservoir quality which varies significantly across the Bakken play. Generally, the extent of the Bakken play lies in northwestern North Dakota as shown in Figure 3 below.

[11] See *A Brief History of Oil Production from the Bakken Formation in the Willison Basin, Nordeng, January 2010* at https://www.dmr.nd.gov/ndgs/documents/newsletter/nl2010/ABriefHistoryofOilProductionfromtheBakkenFormationintheWillistonBasin.pdf .

[12] Ibid.

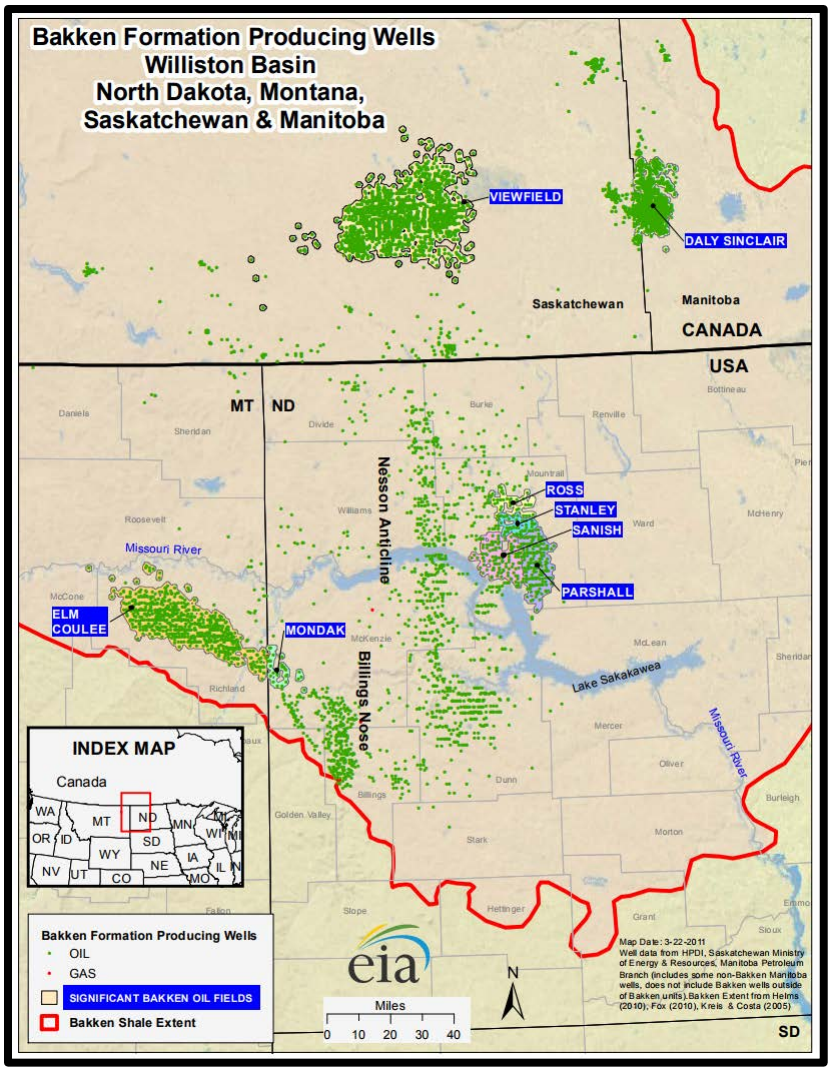

Figure 3: Bakken Formation Producing Wells, Williston Basin, 3.22.2011

Source - U.S. EIA at https://www.eia.gov/oil_gas/rpd/shaleoil1.pdf

37. Technology improvements including the development of more precise directional drilling tools and larger fracturing treatments for individual wells resulted in higher productivity from wells drilled in the oil bearing Bakken and Three Forks formations. As a result, oil production in North Dakota increased dramatically from about 87,500 barrels per day in December 2000[13] to over 236,000 barrels per day by January 2010.[14] Figure 4 shown below provides the historical trend in North Dakota daily oil production from 2010 to present and demonstrates the dramatic change in oil production in North Dakota over the relatively short time period from early-2011 to the peak of production at just over 1,200,000 barrels per day in late-2014.

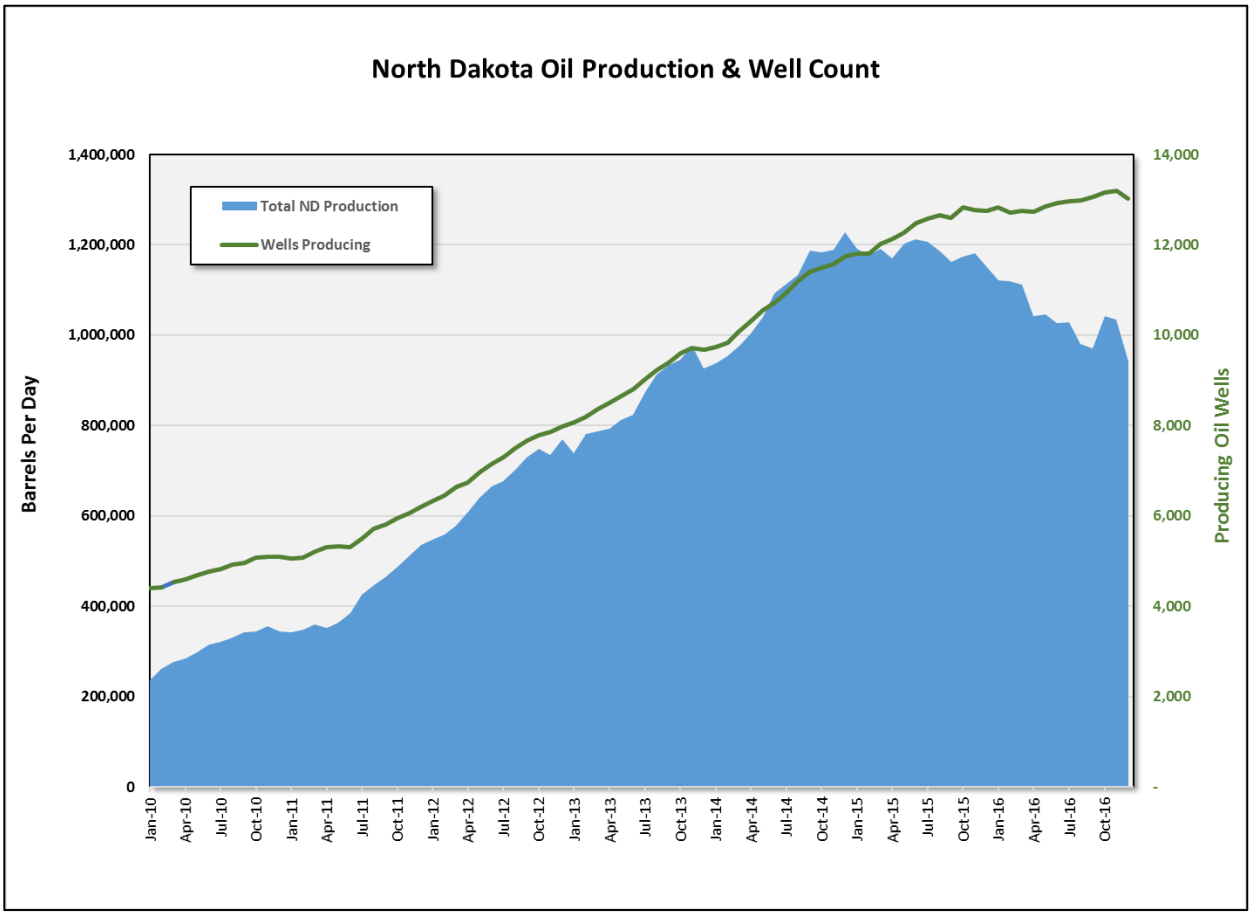

Figure 4: North Dakota Oil Production and Well Count

Sources: Well Count – North Dakota Department of Mineral Resources; production – North Dakota Authority

[13] See ND Monthly Oil Production Statistics at www.dmr.nd.gov/oilgas/stats/historicaloilprodstats.pdf.
[14] Ibid.

38. The rapid increase in Bakken and Three Forks oil production is even more dramatic considering that the production increase was concentrated in the western portion of the state. Although the state's population grew by an estimated 12.7 percent from 2010 to 2016,[15] North Dakota has a relatively small population of approximately 757,952,[16] and therefore a limited demand for crude oil consumption within the state. As has been the case for many years, most of the crude oil production in North Dakota is exported from the state for delivery to refiners operating in other states.[17] In order to clear the market of all available supply as crude oil production increased, producers and marketers exploited all available means of transportation to keep oil flowing and to prevent wells from being shut in.

BAKKEN CRUDE OIL INFRASTRUCTURE

39. With such a rapid increase in production between 2010 and 2015, crude oil transportation infrastructure operating in North Dakota, and in surrounding regions that receive crude oil from North Dakota, did not have sufficient capacity to meet the increasing demand. A combination of truck, pipeline, and rail assets were added in the region in the period from 2008 to 2017 to meet the surging demand for crude oil transportation capacity.

40. Traditionally, trucking operations have primarily served producers at the wellhead and have been utilized to transport crude oil from the operating area at the wellhead, or near the wellhead, until such time that pipeline capacity becomes available to do so. In some locations, pipeline capacity at the wellhead is never installed and trucks are relied upon to transport crude oil from the well for the duration of the well's producing life.

41. Trucking is also utilized in some locations to move incremental volumes of crude oil to balance local supply and demand. In North Dakota, some relatively small volumes of crude oil are trucked from the region for delivery in Canada onto the Enbridge Mainline. Because of the high cost of trucking, both in terms of the actual hauling cost and in terms of road wear/tear,

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[15] See U.S. Census data at https://www.census.gov/quickfacts/ND.

[16] Ibid.

[17] See *Williston Basin Crude Oil Transportation Bottleneck White Paper* by Ron Ness and Lynn Helms, July 7, 2006 at www.dmr.nd.gov/pipeline/assets/bottleneck7-06.pdf.

and the potential for downtime due to weather, most producers prefer wellhead pipeline gathering and pipeline transportation of crude oil to trucking, if the pipeline option is economic and pipeline capacity downstream of the producing lease or field is available. Understandably in 2011, Newfield initially sought to utilize centralized tank batteries in the Bakken to (1) aggregate more production; (2) lower operating costs; and (3) avoid weather issues by sending crude by pipeline[18] thus allowing the produced crude oil to move without any interruption due to weather or unforeseen trucking capacity issues.[19]

42. Figure 5 shown below provides an overview of the crude oil transport capacities for the pipelines and rail terminals serving Bakken producers in North Dakota in the period from 2011 to 2014. Increased pipeline capacity was created with the expansion of several of the existing pipeline systems and the addition in late-2014 of the capacity on the Pony Express pipeline.[20] Pipeline capacity additions in the region were dwarfed by capacities additions in rail. New rail terminals increased rail takeaway capacity in the Bakken region from 115,000 barrels per day in late-2011 to 1,250,000 barrels per day by the end of 2014.

[18] See Deposition of Charles Laudeman, May 10, 2017, Page 45, lines 24-25 and Page 46, lines 1 and 2.
[19] See Deposition of Charles Laudeman, May 10, 2017, Page 46, lines 8-9.
[20] Pony Express was an existing natural gas transportation line that was converted to crude oil transportation service and became operational in the fourth quarter of 2014. See "*Pony Express Oil Pipe Line–Fill Starts; Shipments Seen in Oct.,"* Reuters, July 29, 2014.

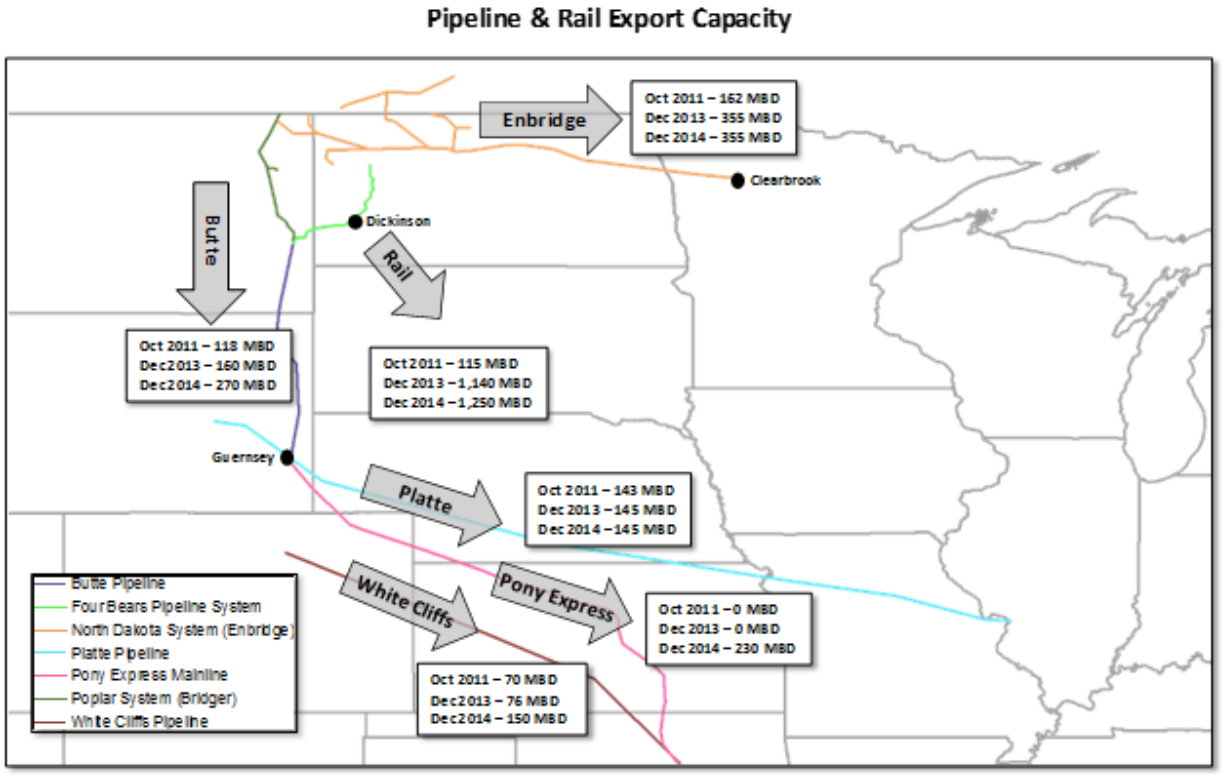

Figure 5: Pipeline and Rail Export Capacity

Sources: North Dakota Pipeline Authority; Company Reports and News Articles

43. Rail transportation of crude oil has typically been a higher cost transportation alternative utilized in special circumstances and when other forms of transportation could not deliver the services necessary to meet customer requirements (i.e., heavy crude, off-spec blends, specialty blends for refiners producing small volumes of unique products such as specialized lubes, small refiners operating in isolated locations sourcing crude from many sources, etc.). However, in shale plays all over the U.S., rail emerged as the "go to" source to meet the immediate increase in demand for crude oil transportation capacity. Rail transport also allowed shippers with disposition flexibility as once loaded onto rail, crude oil can be transported and delivered to refiners located throughout North America. This distribution flexibility provided crude oil produced in North Dakota to supply refiners on the U.S. East Coast, the U.S. West Coast, the U.S. Gulf Coast, and many other locations not readily accessible by the existing pipeline infrastructure. Transport by rail allowed suppliers to by-pass oversupplied market centers like Guernsey in Wyoming and Cushing in Oklahoma, and

to deliver to market centers where competition with imported foreign crudes provided higher netback values to North Dakota than would otherwise have been available. Figure 6 below provides an overview of the web of rail systems moving freight in North America.

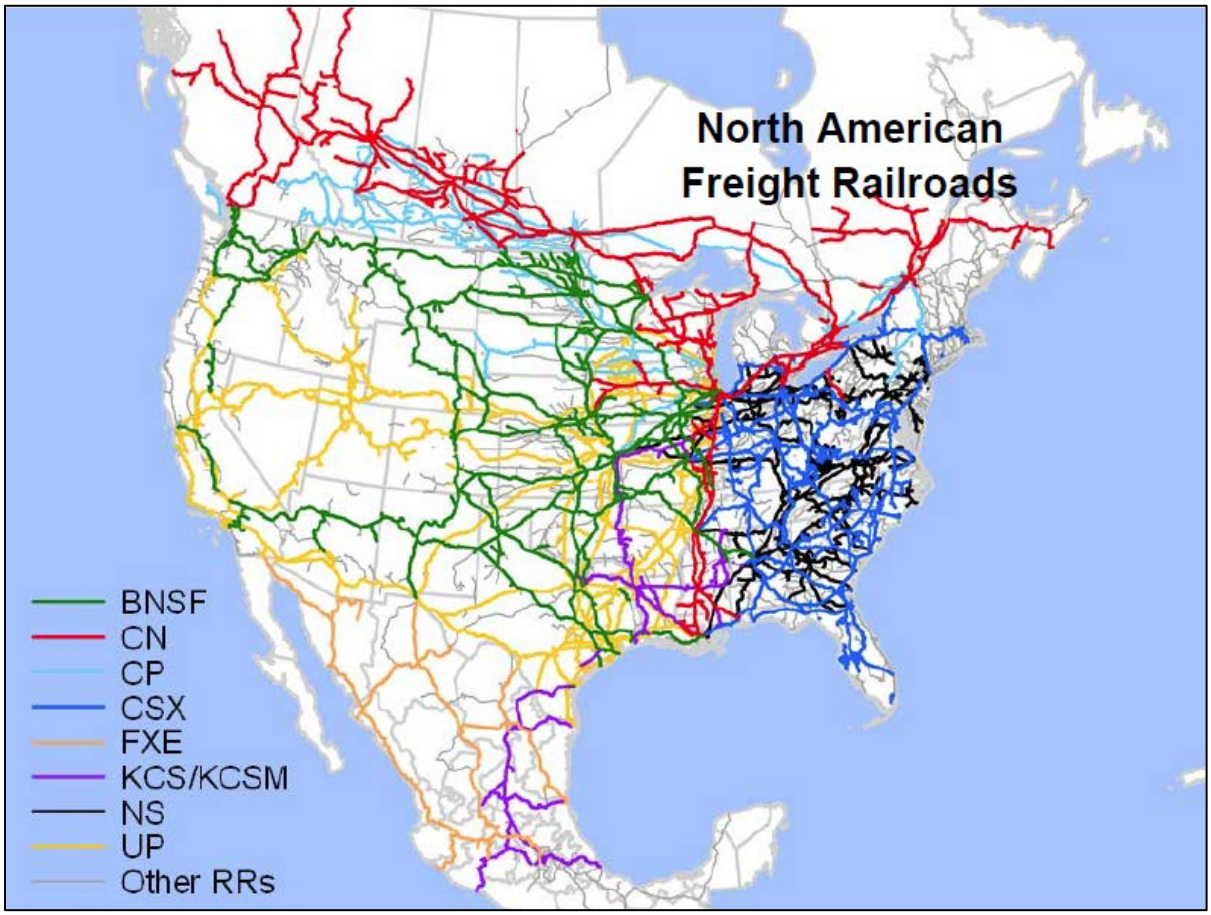

Figure 6: North American Railroad Systems

Source: Moving Crude Oil By Rail, Association of American Railroads, May 2013, Page 7 of 11

44. In North Dakota, as in most other shale production areas, rail facilities were added rapidly. As shown on Figure 7 below, rail provided Bakken producers with immediate transportation capacity and the flexibility to move crude to downstream markets not readily accessible by pipeline, including refineries operating on the U.S. East Coast. Customers seeking to receive crude oil supplies via rail also had to install proprietary rail offloading facilities, or have access to such facilities from existing crude oil terminal or existing refinery facilities.

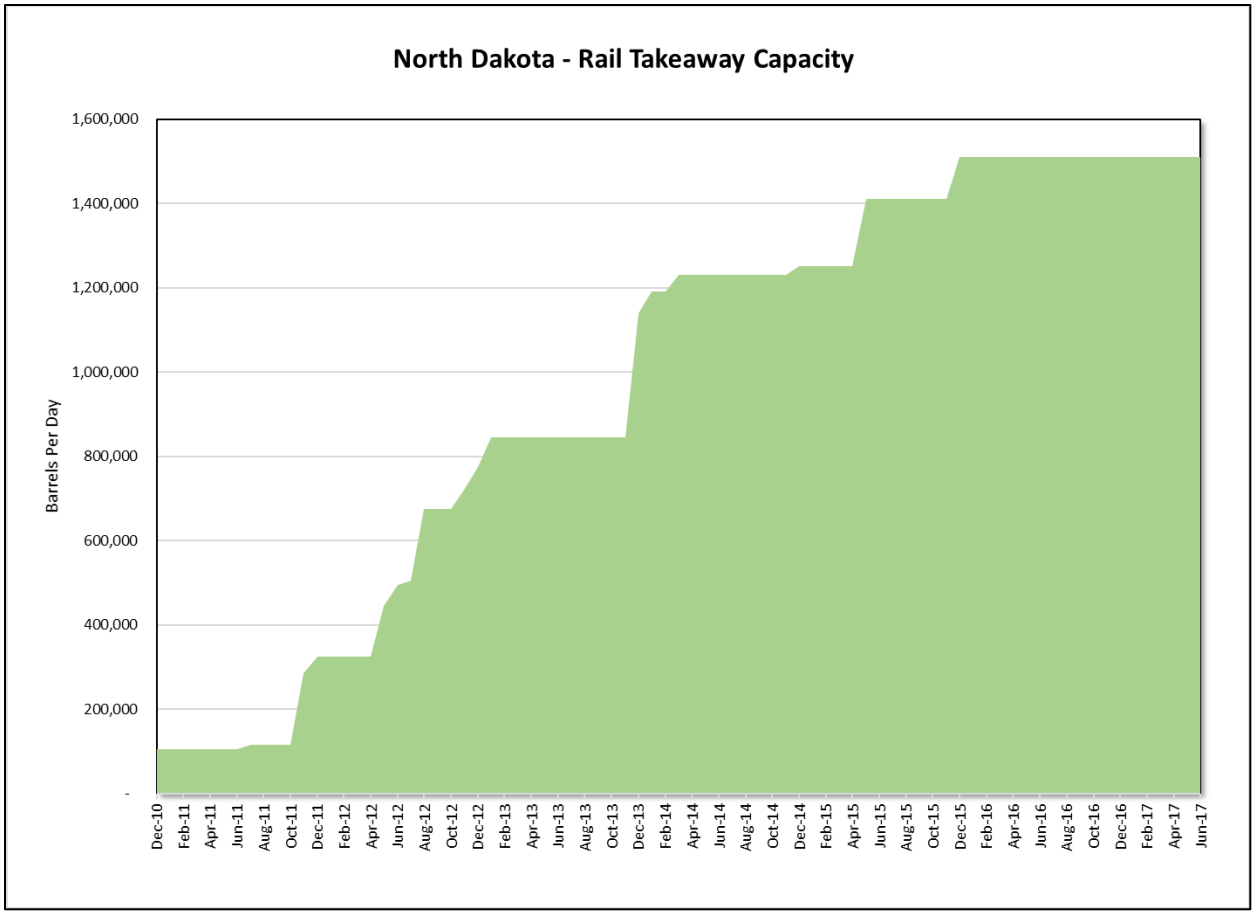

Figure 7: North Dakota Rail Takeaway Capacity

Sources: North Dakota Pipeline Authority; Company Reports and News Articles

45. In February 2011, BNSF typically provided transportation rates for crude oil on a "per-car" basis, a "manifest" movement with rates depending on the weight and capacity of each tank car.[21] The capacity of purpose-built crude oil rail cars transporting relatively lighter crude grades typically ranges from 30,000 to 32,000 gallons, but the actual transport capacity of any particular car depends on the size and configuration of the car itself and the physical properties of the crude oil cargo.[22]

[21] North Dakota's Crude Oil Rail Transportation Infrastructure, February 28, 2011, Pages 4-17, at https://www.dmr.nd.gov/pipeline/assets/Video/03022011/NDPA%20Rail%20Webinar%20Slides%202-28-2011.pdf.

[22] See *Moving Crude Oil By Rail*, Association of American Railroads, May 2013, Page 10 of 11.

46. BNSF also contracted for the movement of unit trains with basic unit train configuration and loading specifications shown below.[23] Unit trains usually consist of at least 50 and sometimes 120 or more cars loaded with the same commodity.[24] These trains use dedicated equipment and generally follow direct shipping routes from/to purpose built loading/offloading facilities resulting in a much lower per unit cost for shipping than transport in manifest cars.[25] Most railroads also accepted both crude oil manifest cars and unit trains on their systems. Rail terminals with the capability to move unit trains had the following characteristics:[26]

    a. Approximately 7,500 feet of track
    b. Loop or straight-track design
    c. Access to mainline in both directions
    d. Loading/unloading in less than 24 hours to keep locomotives [sic]
    e. Loading/unloading must occur greater than 100 feet from nearest mainline
    f. Recommended storage tankage amounts [at loading site]
    g. 118 leased tank cars, 2 buffer cars, 3 locomotives
    h. 66,000 to 81,000 barrels per train, depending on loading configurations

47. Shippers utilizing rail had to have access to rail cars suitable for crude oil transport. As of 2013, the railroads owned less than one percent of the tank car fleet with more than 99 percent of the cars owned by shippers, leasing companies, and other non-railroad entities.[27] As crude oil rail terminals were built in North Dakota, entities seeking to capitalize on the alternative markets served by rail had three primary options for access to rail cars as follows:

    a. Lease existing rail cars from third-party owners; these could be existing cars available for crude oil service or a lease agreement for new cars that were being built, under

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[23] North Dakota's Crude Oil Rail Transportation Infrastructure, February 28, 2011, Pages 4-17, at https://www.dmr.nd.gov/pipeline/assets/Video/03022011/NDPA%20Rail%20Webinar%20Slides%202-28-2011.pdf.

[24] See *Moving Crude Oil By Rail*, Association of American Railroads, May 2013, Page 7 of 11.

[25] Ibid.

[26] North Dakota's Crude Oil Rail Transportation Infrastructure, February 28, 2011, BNSF Presentation, Page 8 (12 of 52), at https://www.dmr.nd.gov/pipeline/assets/Video/03022011/NDPA%20Rail%20Webinar%20Slides%202-28-2011.pdf.

[27] See *Moving Crude Oil By Rail*, Association of American Railroads, May 2013, Page 9 of 11.

contract to be built, or were scheduled to be built at some point in the future. At year-end 2011, Trinity Industries, a rail car manufacturer, had a backlog of rail car orders of approximately two years, a portion of which was backed by lease commitments from the Trinity leasing group.[28] In 2013, the industry was still reporting a large backlog with 80% of the backlog in tank cars used for crude oil shipments;[29]

b. Purchase new cars, typically new cars were ordered for delivery at some date in the future; the later in time the cars were ordered, the longer the expected delay prior to delivery of the cars into service; or

c. Sell crude oil at the inlet to the new rail terminals to a purchaser who already had leased car access or who owned cars of their own.

48. Rail transportation cost is attributable to the following components: (1) miles transported/rail tariffs; (2) days to cycle cars from load point to delivery point and back to load point; (3) rail car loading fees charged by the rail terminal operators; (4) rail car lease fee; (5) rail car unloading fees charged by the receiving rail terminal operators; (6) any fees associated with the movement of the delivered crude oil from the receiving terminal to the final delivery location (pump over fee or pipeline tariff); and (7) accruals for capital maintenance items such as rail car clean out/corrosion repairs for leased cars. In January 2014, the Environmental Impact Statement for the Keystone XL Pipeline Project included Estimated Rail Costs for Various Origination and Destination Pairs in North Dakota at Table C1. Costs to move crude oil by rail from Epping, North Dakota, to various locations on the U.S. East Coast, U.S. West Coast, U.S. Gulf Coast, and in Canada are summarized with total rail costs varying from $11.83 to $14.73 per barrel. Various other rail and pipeline transportation costs have been published by industry sources in the period from early-2013 to May 2017. For deliveries from North Dakota to various locations on the U.S. Gulf Coast

[28] See Trinity Industries, Inc., Form 10K, Annual Report as of December 31, 2011, Page 4 of 97.

[29] See "Ordering Crude Oil Tank Car from Dallas Firm? Expect Long Wait Amid North Dakota's Oil Boom." Dallasnews.com. June 2013.

and in PADD III, rail costs reported publicly by industry advisors and participants ranged from $11.50 to $17.32 per barrel, as shown in Table 1 below.

Bakken Rail Export Cost Estimates					
			Transportation Cost		
	Origin	Destination	Rail	Pipeline	Source
1/1/2013	North Dakota	Port Arthur	$14.50		BMO Capital Markets 01/2013 (unit trains)
1/1/2013	North Dakota	Cushing	$11.50		BMO Capital Markets 01/2013 (unit trains)
3/1/2013	Bakken	Gulf Coast	$15.00	$11.00	RBN Energy - 7/8/13
5/1/2013	Bakken	Cushing	$13.00		RBN Energy 5/5/13
5/1/2013	Bakken	Gulf Coast	$15.00		RBN Energy 5/5/13
10/29/2013	North Dakota	Cushing	$12.00		RBN Energy - Bakken Crude Netbacks.... 10/29/13
10/29/2013	North Dakota	Gulf	$15.00		RBN Energy - Bakken Crude Netbacks.... 10/29/13
1/1/2014	Epping, ND	Delaware	$12.27		Keystone XL Supplemental EIS January 2014
1/1/2014	Epping, ND	Port Arthur, Tx	$11.83		Keystone XL Supplemental EIS January 2015
1/1/2014	Epping, ND	Vancouver	$12.00		Keystone XL Supplemental EIS January 2016
1/1/2014	Epping, ND	Los Angeles	$12.86		Keystone XL Supplemental EIS January 2017
1/28/2014	Bakken	St. James	$15.00	$11.00	RBN Energy - 7/8/13
6/1/2014	Bakken	Padd 3	$15.00	$11.00	BMO Crude by Rail Update June 2014
3/1/2015	Bakken	Gulf Coast	$13.00	$9.50	American Oil & Gas Reporter, March 2015
2/18/2014	Bakken	St. James	$17.32		Genscape Petrorail Report 2/18/14
3/31/2015	Bakken	St. James	$15.66		Genscape Petrorail Report 3/31/15
7/12/2016	Bakken	St. James	$12.11		Genscape Petrorail Report 7/12/16

Table 1: Bakken Rail Export Cost Estimates

49. Marketing companies realize profits on the net margin between the revenues earned for sales to downstream markets and the costs to acquire and transport crude oil between producing regions like North Dakota and downstream market centers near refineries such as the U.S. East Coast and U.S. Gulf Coast. With rail transportation costs of $12-$15 per barrel, active management of rail resources was necessary to minimize the associated financial risk associated with this highly flexible disposition alternative, especially given that access to rail terminals and rail cars required long-term financial commitments for build-out or leasing capacity.[30]

50. As shown in Figure 8 below, the market differential between North Dakota spot price as represented by the Platts Spot Price Quote for Bakken Blend Ex-Clearbrook relative to the Spot Price for WTI Cushing rarely traded at a differential of more than $15 per barrel in the period from November 2011 to late-2016. When the differential exceeded $15 per barrel,

[30] See "Moving Crude Oil by Rail," Association of American Railroads. Page 7, May 2013; GATX Corporation Stifel Transportation and Logistics Conference 2014, February 2014; and Update 2 – Phillips 66 Makes $1 Bln Commitment to Ship Bakken Crude." Reuters. January 8, 2013.

shippers with contracted access to rail clearly could have taken advantage of the opportunity to rail barrels out of North Dakota and may have earned a higher return than selling their crude at Clearbrook. However, not all Bakken production had, or has today, economic access to the Clearbrook delivery market. Pipeline access from the Bakken east to Clearbrook was limited by capacity constraints on the Enbridge Pipeline North Dakota and the line was apportioned as more volume was nominated by shippers to move volume than capacity was available to ship to Clearbrook.[31]

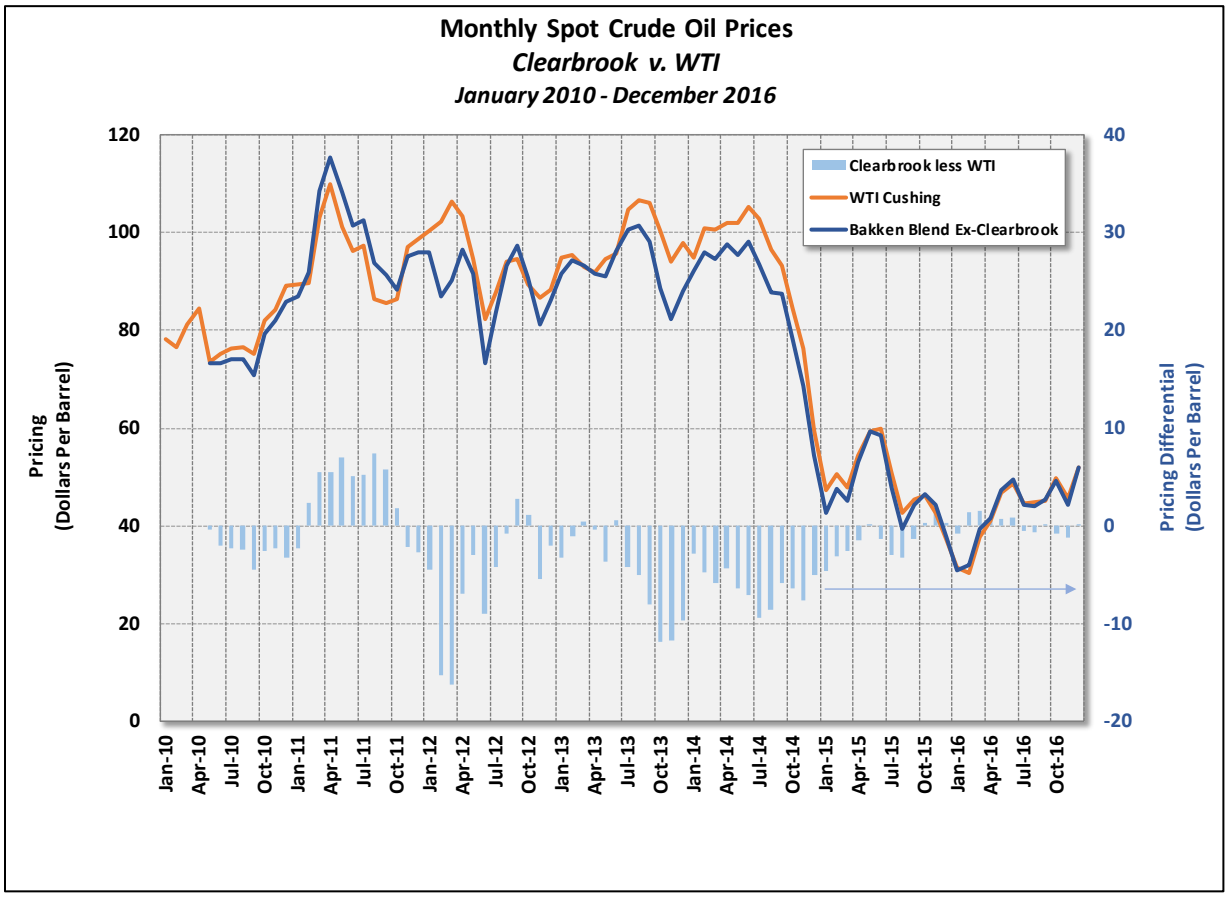

Figure 8: Monthly Spot Crude Oil Prices – Clearbrook v. WTI

Source: Platts U.S. Crude Oil Assessments

51. Regulatory response to crude oil rail car accidents further complicated accessibility and cost of the rail alternative since 2011. Federal regulations for tank cars are set by the U.S.

[31] FERC Order Accepting Tariff issued September 14, 2012 Enbridge Pipeline (North Dakota) LLC.

Department of Transportation (U.S. DOT) – Pipeline and Hazardous Materials Safety Administration (PHMSA).[32] The American Association of Railroads (AAR) Tank Car Committee set industry standards regarding the design and construction of tank cars in North America and is comprised of representatives from AAR, rail car owners, manufacturers, and rail hazmat customers and includes active participation from the U.S. DOT, Transport Canada, and the National Transportation Safety Board. In August 2011, the AAR Tank Car Committee adopted industry standards for new tank cars and the stronger CPC-1232 tank car design became the standard for cars ordered after October 1, 2011[33] and in November 2013, the industry requested that PHMSA require retrofits to 92,000 existing tank cars used to transport flammable liquids.[34] In May 2014, PHMSA and the Federal Railroad Association (FRA) issued a Safety Advisory discouraging the use of the older, DOT-111 tank cars and DOT issued an Emergency Order requiring railroads to inform first responders of crude oil routes.[35] In response to the Safety Advisory, market participants changed behavior and utilization of the DOT-111 cars dropped in favor of the newer, CPC-1232 tank cars. Lack of access to the DOT-111 cars limited rail access for some shippers and gave those purchasers with owned or leased CPC-1232 cars a competitive advantage to purchase crude oil at inlets to rail terminals or at points closer to the wellhead.

52. Figure 9 below provides the historical North Dakota crude production and capacities with respect to refining, pipeline, and rail disposition alternatives. Rail capacity has dominated available export transportation capacity since 2012. Despite additional pipeline capacity, rail has continued to provide incremental capacity necessary to clear available supplies from the producing region and avoid potential well shut-in due to lack of accessible markets. In addition, some end-user refiners with access to owned rail cars, or cars controlled under long-

[32] Transport Canada is the regulatory body governing tank cars in Canada.
[33] See TIMELINE: FREIGHT RAIL CBR SAFETY ACTIONS at https://www.aar.org/todays-railroads/what-we-haul/crude-oil-by-rail.
[34] See *Moving Crude By Rail*, Association of American Railroads, December 2013, Page 1 of 10.
[35] See TIMELINE: FREIGHT RAIL CBR SAFETY ACTIONS at https://www.aar.org/todays-railroads/what-we-haul/crude-oil-by-rail.

term lease may also utilize rail to provide base load supplies of NDL to certain refining facilities even in periods when spot market prices/economics appear more favorable.

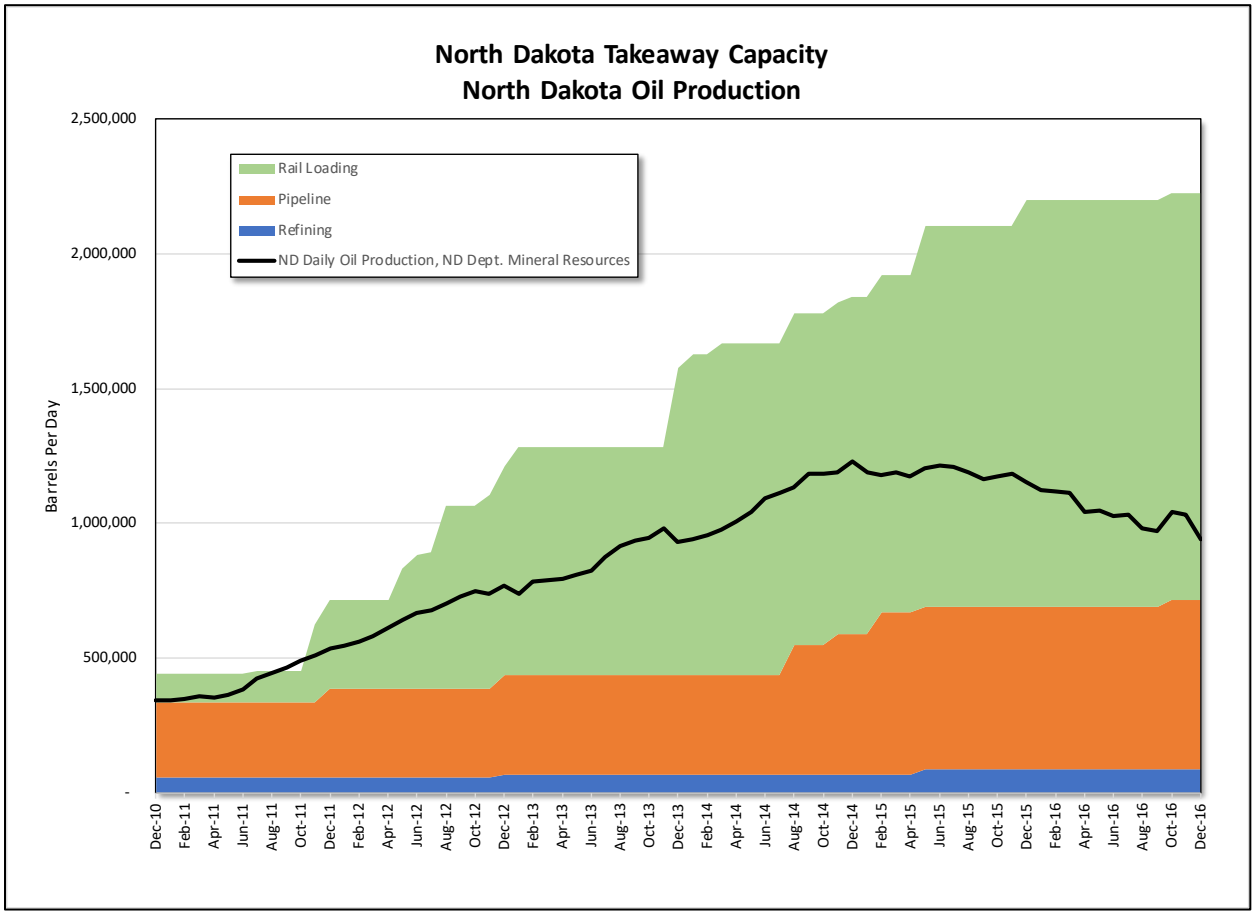

Figure 9: North Dakota Takeaway Capacity

Sources: North Dakota Pipeline Authority; Company Reports and News Articles

53. Another factor contributing to increased rail movements out of North Dakota was the oversupply of light sweet crude oil in inland crude markets relative to the supply/demand balance for similar grades in coastal U.S. markets. The light sweet crude supply/demand dislocation was evidenced by the price differential between spot WTI Cushing and LLS prices at the time. Due to the oversupply of crude oil in the Mid-Continent and Rockies and the lack of transportation capacity to export excess supply,[36] spot WTI Cushing prices in late-2010

[36] EIA *This Week In Petroleum: Market response to the WTI-Brent spread is constrained by logistical challenges.* February 24, 2011.

were depressed relative to the spot prices for Brent crude sourced from the North Sea and LLS, a sweet crude traded at St. James, Louisiana.

54. Prior to 2012, the crude oil pipelines between the Gulf Coast and Cushing only moved crude oil north into Cushing and industry participants stored the excess crude oil. As shown in Figure 10 below, Cushing stocks of crude oil grew rapidly and continued to grow even with the initial Seaway pipeline reversal in the summer of 2012.[37] As Cushing inventories reached record levels, the WTI differential to LLS began to widen and encourage market participants to incur the costs of shipping crude oil by rail to avoid physical deliveries in Cushing and relieve some of the supply overhang.[38]

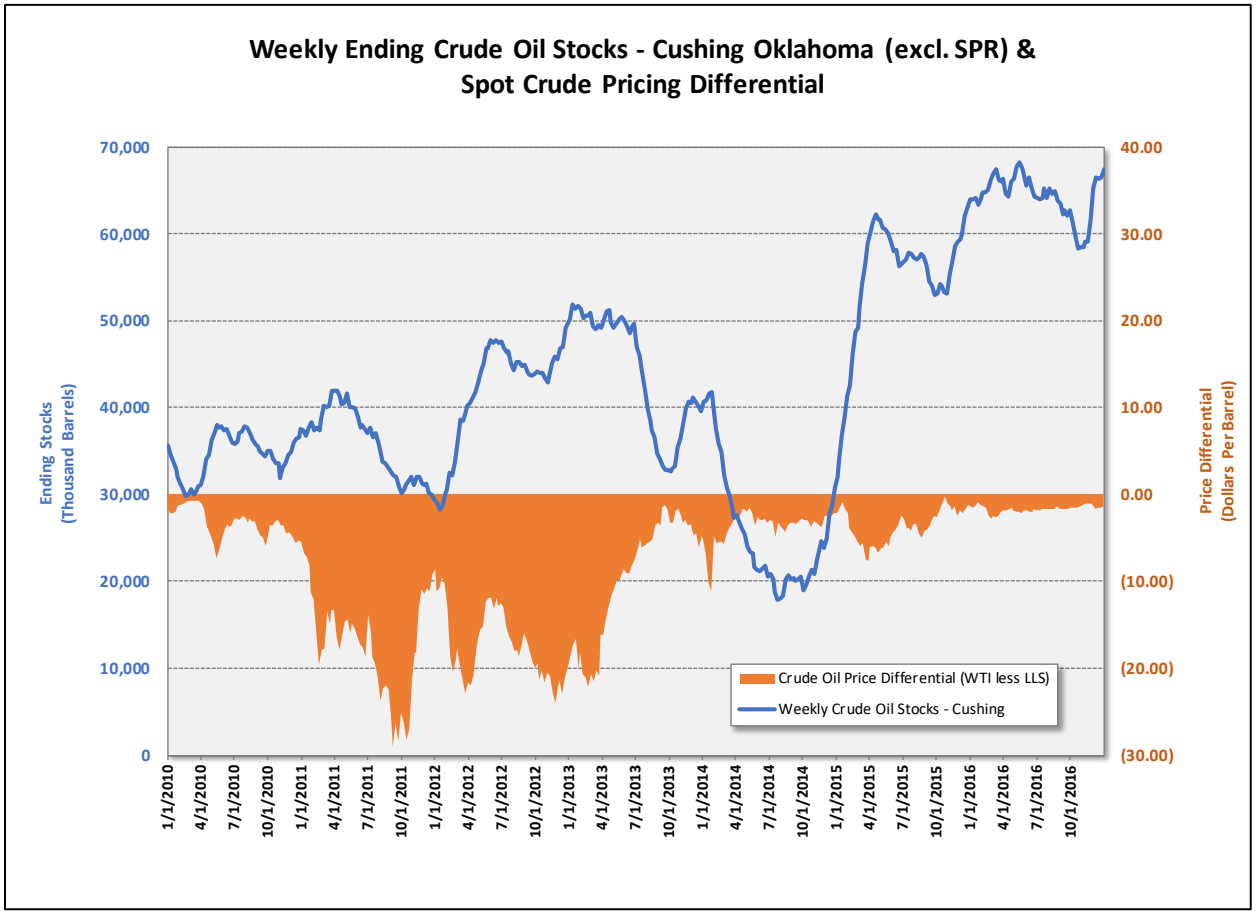

Figure 10: Weekly Ending Crude Oil Stocks – Cushing Oklahoma & Spot Crude Pricing Differential

Source: Stocks – U.S. Energy Information Administration; Pricing – Platts U.S. Crude Oil Assessments

[37] See "Seaway Pipeline Sends Oil to Texas in Historic Reversal." www.Reuters.com, May 19, 2012.
[38] See "Unlocking the Crude Oil Bottleneck at Cushing" www.Bloomberg.com. May 16, 2012.

55. With spot WTI Cushing crude trading well below similar grades in the U.S. coastal markets compounding the already steep differentials realized for Bakken relative to WTI at the time, rail economics were favorable for Bakken exports from the region for an extended period of time. As shown in Figure 11 below, the price of LLS at St. James exceeded the Clearbrook price by as much as $23 per barrel in late-2011. With rail costs of $12-$15 per barrel, the incremental netback value to Bakken producers could be as much as $12 per barrel for crude oil supplies having access to rail capacity.

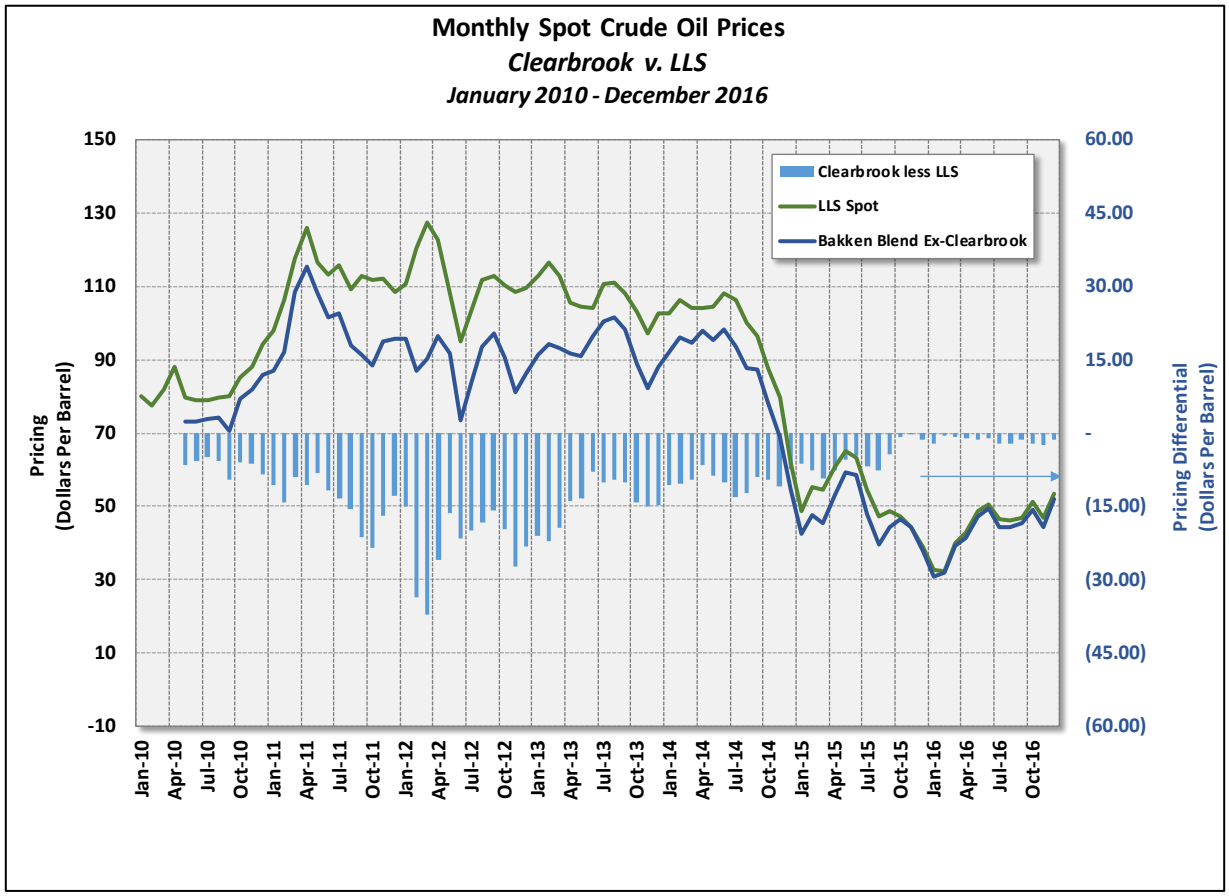

Figure 11: Monthly Spot Crude Oil Prices – Clearbrook v. LLS

Source: Platts U.S. Crude Oil Assessments

56. In late-2011 and early-2012, the increase in North Dakota production challenged the available crude disposition capacity. In this period, North Dakota prices experienced relatively high differentials to WTI due to these transportation restraints. According to EIA, "*Rapidly growing production in the Bakken coupled with lagging takeaway infrastructure (pipelines and rail capacity) contributed to Bakken prices that were as much as $28 per barrel lower than*

WTI in early 2012.[39] However, in the medium term, rail capacity in North Dakota was overbuilt resulting in total crude oil takeaway capacity of over 2,000,000 barrels per day, well in excess of the roughly 1,000,000 barrels per day of current production from the region.

57. In the period from late-2010 to mid-2017, shippers in the Bakken region made use of all forms of transportation available to keep wells producing and crude flowing. Shippers also took advantage of higher rail netback prices in 2013 and 2014 in the period when WTI prices were depressed due to the inland oversupply of light sweet crude oil as discussed above. As shown on Figure 12 below, a significant proportion of the crude being transported from the Williston Basin, which includes North Dakota Bakken production, was moving by rail in 2015 and early 2016, even as pipeline capacity continued to increase (see Figure 8 above.).

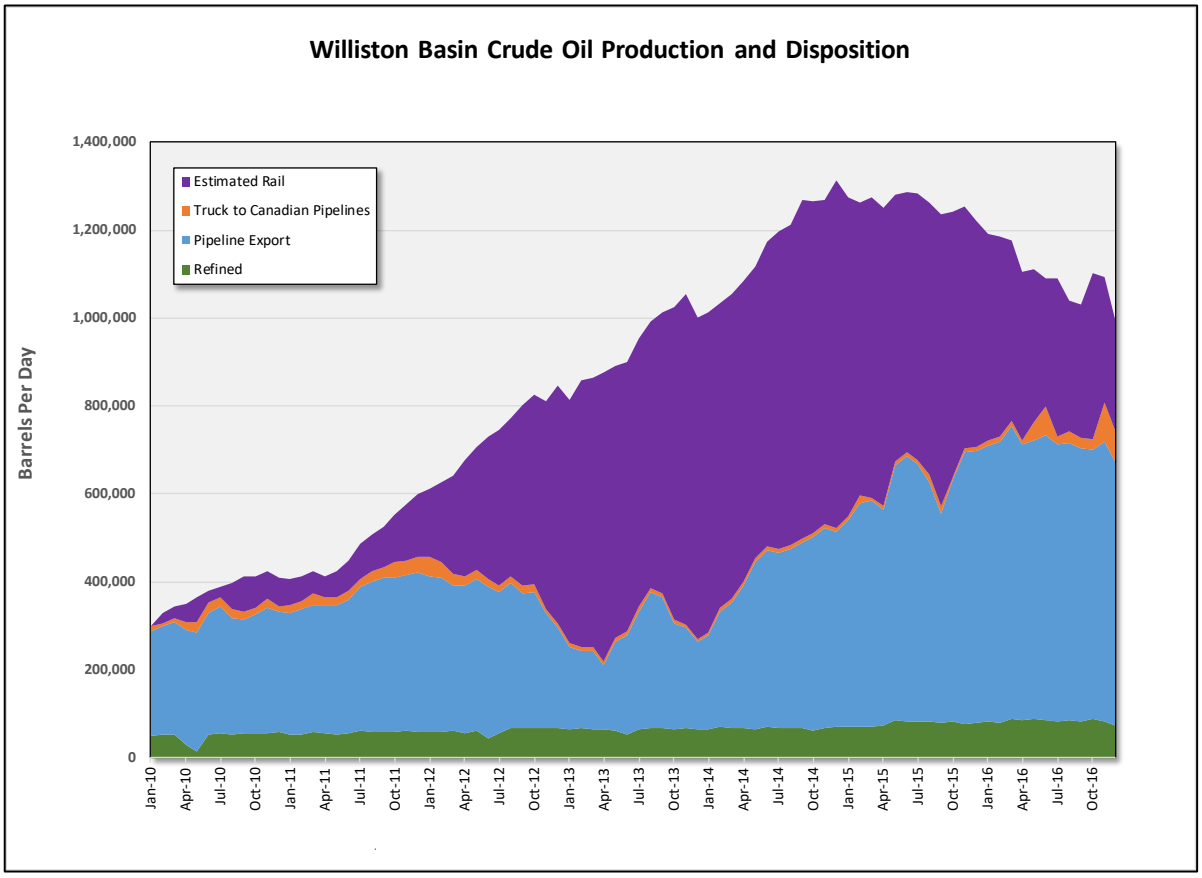

Figure 12: Williston Basin Crude Oil Production and Disposition
Source: North Dakota Pipeline Authority

[39] See "Bakken Crude Oil Price Differential to WTI narrows over last 14 months." EIA Today in Energy. March 19, 2013.

MARKET EXPECTATIONS 2011

58. In late-2011, when the Agreement was negotiated and signed, industry projections indicated that pipeline constraints would continue and likely escalate for Bakken exports. Figure 13 shown below was included in an August 2011 presentation by the North Dakota Pipeline Authority and provides the expected projections for oil production and export capacity. As shown, future crude oil production was expected to outpace pipeline capacity additions, even with the addition of the Keystone XL capacity, a project that has still not been completed. Given the forecast at the time, rail export capacity was necessary to balance market supply and export demand even with the anticipated pipeline capacity additions.

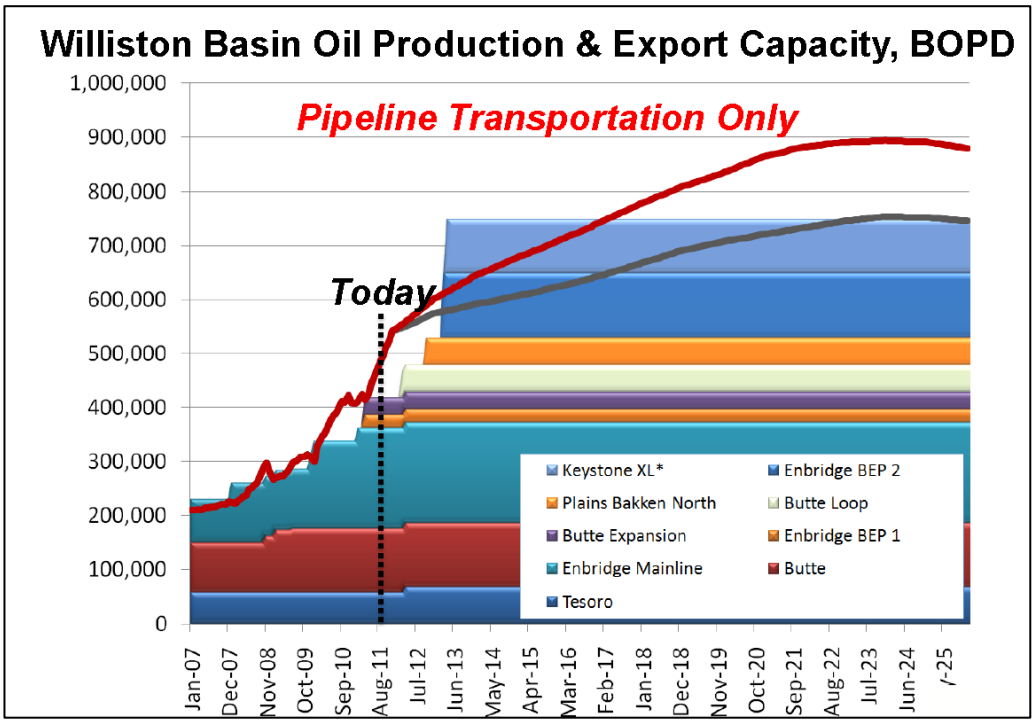

Figure 13: Williston Basin Oil Production & Export Capacity, BOPD

Source: North Dakota Pipeline Authority – Energy Development and Transmission Committee; August 18, 2011 at https://www.dmr.nd.gov/pipeline/assets/pdf/08262011/NDPA%20EDT%208-18-2011%20Full%20Page.pdf

59. On February 28, 2011, the North Dakota Pipeline Authority chaired a webinar entitled "North Dakota's Crude Oil Rail Transportation Infrastructure" and provided a forum for market participants and potential providers to share information on rail and rail infrastructure in the

region.[40] Rangeland Energy, LLC ("Rangeland"), a midstream company that subsequently developed the COLT crude oil trading hub located in North Dakota, provided a presentation entitled "COLT Project Presentation" as part of the NDPA webinar.[41] The Rangeland presentation at Page 5 included an assessment of the then-current Bakken Crude Markets and market price differentials for these potential Bakken disposition locations versus WTI at Cushing, as shown in Figure 14 below:

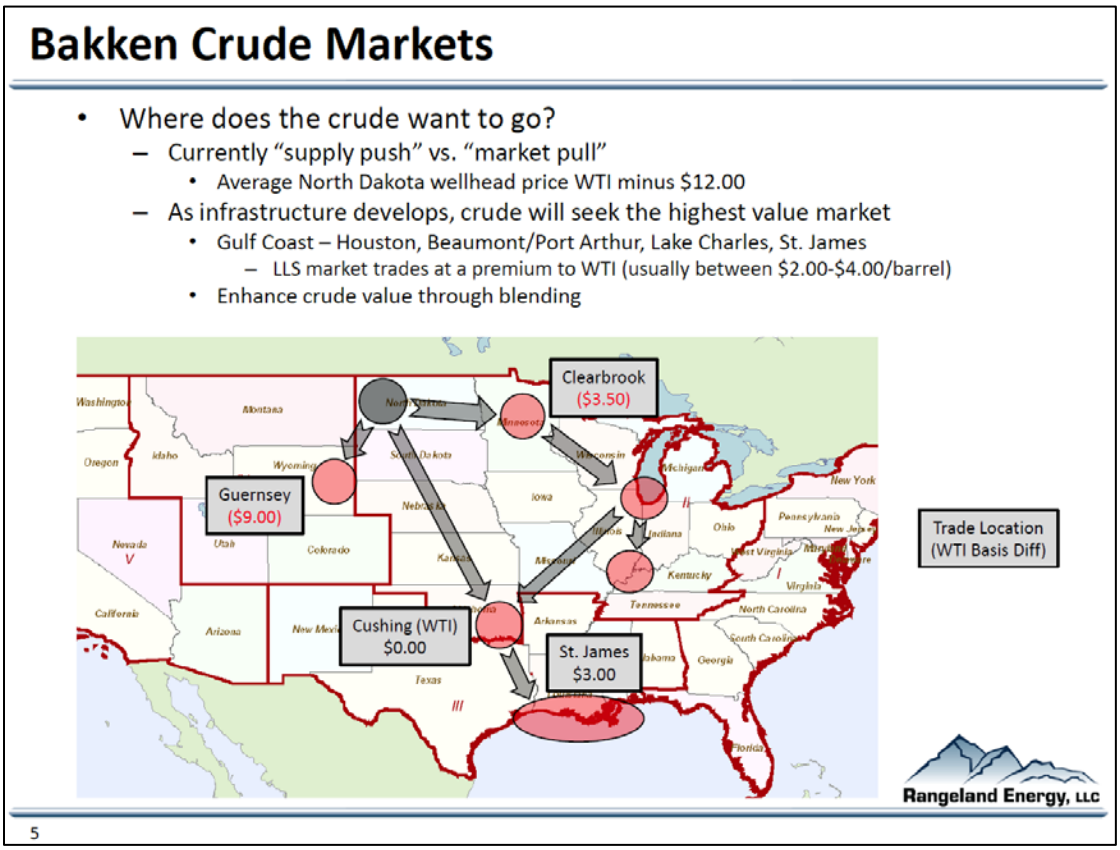

Figure 14 – Bakken Crude Markets

Source: Rangeland Presentation, Page 5, February 28, 2011, NDPA Webinar at https://www.dmr.nd.gov/pipeline/assets/Video/03022011/NDPA%20Rail%20Webinar%20Slides%202-28-2011.pdf

60. Rangeland's assessments of the potential Bakken crude markets in early-2011 are consistent with the price trends and market differentials as provided in Appendix D and elsewhere in

[40] See North Dakota's Crude Oil Rail Transportation Infrastructure, February 28, 2011 at https://www.dmr.nd.gov/pipeline/assets/Video/03022011/NDPA%20Rail%20Webinar%20Slides%202-28-2011.pdf for the agenda and presentations from this meeting.
[41] Ibid, pages 18 to 27.

this report, and confirm the industry's view of crude markets at that time. Light sweet crude grades were oversupplied in the Williston Basin area during this period as production of North Dakota Sweet from the Bakken play ramped-up substantially. Existing crude oil pipeline transportation capacity was full and producers were seeking new routes to economically access higher netback markets on the U.S. East Coast, the U.S. West Coast, in the U.S. Mid-Continent, and on the U.S. Gulf Coast. Specifically, producers wanted to deliver crude to destinations such as St. James, Louisiana, where refineries had capacity to run light sweet crude and where NDL crude oil could compete directly with, and push out, foreign imports of light sweet crude oil. Based on the Rangeland assessment shown above, NDL delivered to St. James could earn $6.50 more per barrel than NDL delivered to Clearbrook and $12.00 per barrel more than NDL delivered to Guernsey.

61. In early-2011, Bakken producers like Continental Resources[42] were providing investors with historical performance and projected financials with respect to their assets in the Williston Basin. For Continental, projections were based on expectations of oil prices and committed capital of over $1 billion in new well drilling in North Dakota in 2011.[43] In order for producers like Continental to continue development drilling Bakken wells, significant cash generation from existing production was necessary to repay drilling loans and fund on-going operations. Wells drilled and completed, but without access to transportation capacity, cannot be produced and therefore crude oil cannot be sold to generate cash flow. With wells shut in, or worse yet drilled but not completed, producers cannot earn return of, or return on, the capital invested for reserve development. Without sufficient incoming cash, producers must allocate remaining cash to meet contractual commitments while balancing the need to make principal and interest payments and/or distribute dividends to creditors and investors. Maintaining this balance was made even more precarious for some producers given the relatively high capital commitments required to secure leases and agreements to be bound by continuous development or production clauses required by some lessors. In summary,

[42] See Continental Resource, Fourth Quarter 2010 Update, March 7, 2011, Page 5.
[43] Ibid, Page 22.

Bakken producers needed to not only drill and successfully complete wells, but also to monetize crude oil reserves in order to provide the cash flow necessary to sustain rapid growth of their companies and secure medium-to-long-term financial stability.

THE EEO/NEWFIELD AGREEMENT

62. The primary term of the Agreement as specified by the parties was five years. In the crude oil marketing segment of the industry, a five-year contract is considered to be a long-term agreement since the crude oil markets trade every business day of the year and trading within the sector is influenced by a wide variety of local, regional, national, and international factors in real time. Long-term contracts are often associated with commitments to new or expanded infrastructure which are typically long-lived assets, or business joint ventures to support new, large-scale reserve developments. Both of these factors influenced participants in the Bakken region to sign long-term contracts in support of new and expanded infrastructure development to ensure adequate crude oil export capacity from the region.

63. The Agreement provided Newfield with access to multiple outlets outside of North Dakota, even though Newfield elected to deliver and sell their crude oil at or near the wellhead. EEO had access to pipeline capacity, with the option to deliver off of the pipeline to the rail via the Bakken Oil Express rail terminal and through rail had access to multiple downstream market delivery locations across North America. As Charles Laudeman, Newfield's representative negotiating the Agreement with EEO said, "My opinion would be that you need to have multiple options, out of the basin, given the capacity issues that were ongoing out there."[44] The EEO/Newfield Agreement provided Newfield with pipeline and trucking options at the lease and ensured that the crude oil produced by Newfield had access to multiple pathways to downstream markets outside of North Dakota. The Agreement provided the multiple options for transportation out of the basin that Newfield sought in 2011. Mr. Laudeman also confirmed that transportation optionality might come at a cost to Newfield in that being

[44] See Deposition of Charles Laudeman, May 10, 2017, Page 60, lines 15-20.

guaranteed multiple options out of the basin may not always guaranty the best price or the lowest differential.[45] This makes sense considering the market factors discussed herein.

64. The duration of a crude purchase and sale agreement does not necessarily correlate to the transaction price realized under the contract in any given month or over the term of the contract. Crude oil prices change as the result of market dynamics and are influenced by many factors on a daily basis. Pricing formulas that result in maximum crude transaction value in one month may realize relatively low transaction value the next month depending on the negotiated components of the pricing formula and changes in the underlying fundamentals in the crude oil markets. Contracting parties can be fairly certain that a fixed price sale for crude deliveries in the coming month, especially when negotiated near the end of the trading period, will end up as being either a high price or a relatively low price when compared to the market average price for the month, but the relative transaction price is never known for certain until the trading month is complete and all pricing terms as negotiated have been determined under the contract. As pricing formulas take on more "floating" terms that are priced during the month of delivery[46] or over many months or years following the negotiation, values associated with the pricing terms of the contract are subject to change as the result of unanticipated or unexpected changes in the market. The longer the duration of the contract, the greater the exposure to changes in the market and the more likely the value proposition will change relative to the parties' original expectations.

65. Realized contract values are often reviewed at the end of each trading month in the normal course of evaluating the execution of trading strategies and actual versus projected market dynamics. The value of any term contract based on the market conditions as of any specified date or based on the average trading values in the market in any given month is said to be a

[45] See Deposition of Charles Laudeman, May 10, 2017, Page 60, lines 16-25.

[46] For example, the pricing formula is negotiated and agreed upon given the market prices and pricing bases in the month PRIOR to production, but the actual pricing variables are not determined until the following month and during the month that the crude oil is produced. So the parties contract for the sale in the month prior to production and the crude oil is priced only in the month of production.

measure of the "mark to market" or "MTM" value of the contract as of the specified date.[47] MTM contract values are just as dynamic as the market itself, so that at any point in time, the MTM value of a contract may be higher or lower than the expected value of the contract to either of the parties as of the effective date or execution date. Should one contracting party wish to execute a contract only if the other contracting party agrees to deliver maximum market value in every month, the terms and conditions of any contract may be modified to include so-called "favored nations" language. For example, a producer may specify that a marketing company or refinery agree to purchase crude for the same price as is paid under the marketing company's highest value crude oil purchase during any given month or during every month of a long-term contract. Although the inclusion of such language can be effective in returning a relatively high price to the producer in each and every month of delivery, marketing companies are typically reluctant to agree to such terms given the practicality of the accounting for such an agreement and the risk associated with guaranteeing trading partners the "highest prices paid under other contracts" which may not include identical terms and conditions with respect to the potential overall consideration.

66. Purchase price, truck transportation charges, and transfer of title are addressed in Section 4 of the Agreement for crude oil purchased by EEO from Newfield at the inlet flange to the Four Bears Pipeline ("Four Bears"). The location of the Newfield producing wells are provided along with the location of the Four Bears as shown on Figure 15 below.

[47] See www.investopedia.com/terms/m/marktomarket.asp.

Newfield Operated Wells

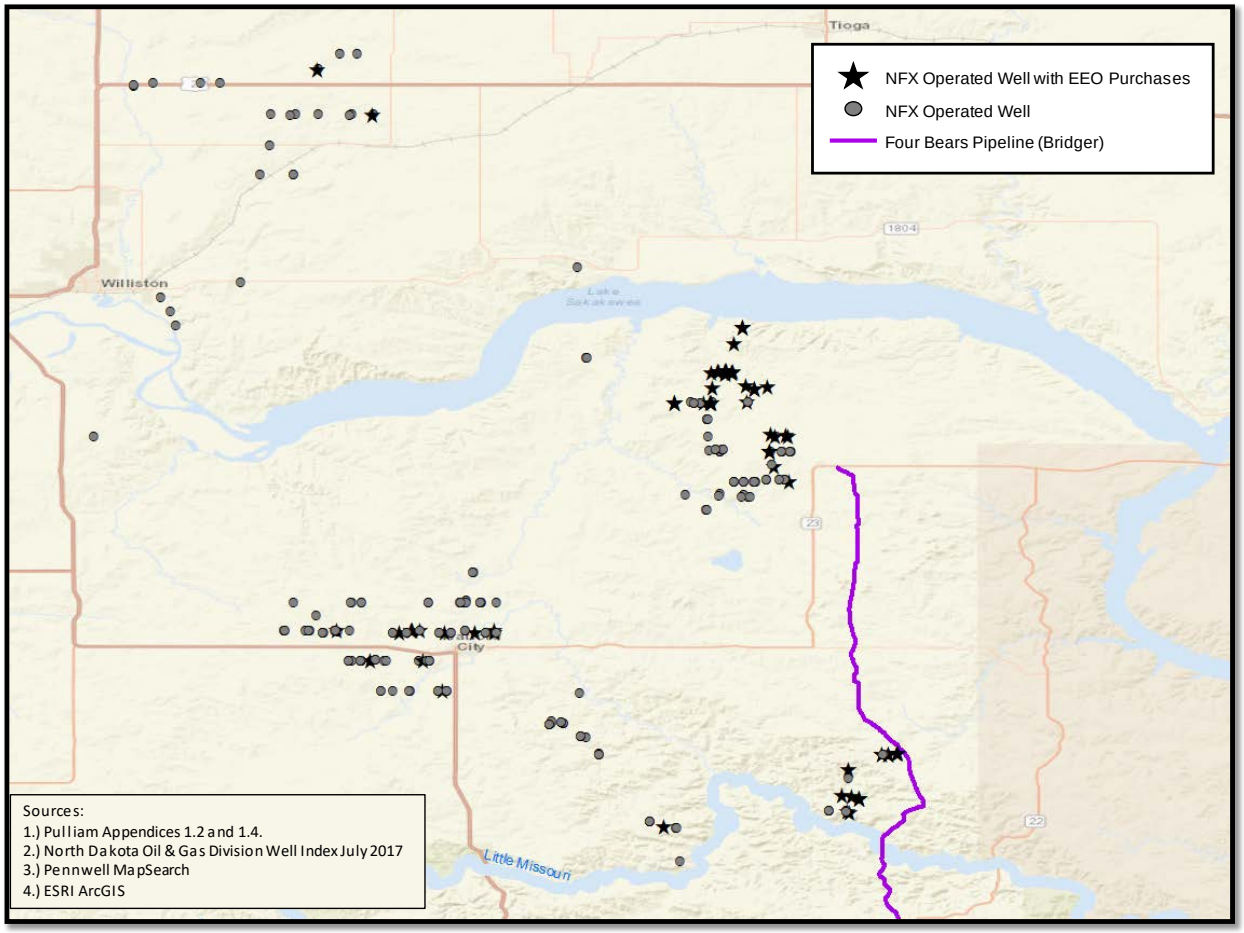

Figure 15: Newfield Operated Wells

67. The Four Bears project was initiated to provide crude oil produced in the northwestern region of North Dakota with an additional pipeline market outlet via access to existing and proposed pipeline capacity to Guernsey and to the new rail terminal capacity operated by Bakken Oil Express. Crude delivered to Four Bears was gathered via truck and pipeline for transport via interconnecting pipeline to Baker, Montana, and southward, or to the Bakken Oil Express for loading on rail cars. Newfield volumes delivered to EEO at or near the wellhead for transport each month were not necessarily, per the Agreement,[48] delivered to Four Bears.

[48] See Confidential Eighty-Eight 0001933 to 0001939.

68. As per Section 4 of the Agreement, EEO took title to the crude oil at either (1) the flange connection between the delivery equipment at the Producer's tankage and the loading arm of the Purchaser's transport truck; or (2) at the inlet flange to the Carrier Line if producer delivers crude oil by Carrier Line. Newfield sold their crude near the well or at injection points into the Carrier's Line at points not far from the producing wells and not at market centers located hundreds of miles from the wells. EEO accepted title to the crude at these remote locations and arranged for the transportation and sale of the Newfield volumes along with other supplies of crude oil acquired from producers in the state.

69. It was up to EEO to daily take the volumes delivered by Newfield, and in conjunction with other crude oil supplies purchased in the region, arrange for gathering, storage, inventory, sale, transportation, and delivery of the volumes in each producing month. EEO contracted for, leased, or owned the necessary transportation capacity to ensure that the delivered volumes of crude oil would move and clear the North Dakota market in each and every month by truck, pipeline, and rail. As is typical in the industry for these type of agreements, under the terms and conditions agreed to by the Parties in Section 4 of the Agreement, no restrictions were placed on where the crude oil could be transported, by what means, or to which entity the crude oil would be sold once it was delivered to EEO. As such, EEO had the flexibility to transport, combine, blend, and deliver the crude oil as market supply, demand, and prices changed over time. EEO's only obligation to Newfield was to price the purchased volumes based on the defined pricing formula which includes "Eighty-Eight's differential for NDL" for which no specific formula or methodology was provided in the Agreement.

70. Crude oil marketing companies like EEO are "market makers." These companies maintain the financial means and physical assets to provide liquidity in crude oil markets by making offers to purchase small volumes of daily crude oil production and to negotiate contracts to deliver aggregated volumes of crude oil to meet monthly downstream demand with physical deliveries via trucks, pipelines, rail, and marine vessels. In order to acquire the volumes necessary to meet the downstream demand, and of specific customers in particular, crude oil marketing companies "make the market" by bidding for available volumes of supply and

offering aggregated volumes of crude for sale. Depending on the market characteristics at any given time, and the expectations of market participants buying and selling crude oil at any given time, market companies negotiate pricing terms and conditions to consummate crude oil purchases and sales. Contract pricing terms may be based on fixed and flat pricing, floating pricing, index pricing with differentials, or any formula to which both parties agree.

71. In the subject Agreement, the parties agreed to price the crude delivered at or nearby to Newfield's producing wells as follows:

> *"4(a) The average daily settlement price of the NYMEX near month WTI crude oil contract as it trades for the calendar month of delivery, excluding weekends and holidays, gravity deemed 40 degree API, EDQ, minus Eighty-Eight's differential for NDL (North Dakota Light) type crude oil minus all transportation from Guernsey, Wyoming back to the point of purchase, and less a marketing fee of $0.85 per barrel minus transportation charges if the barrel is trucked from the wellhead to the Carrier Line inlet flange, if applicable."*

72. Considering the crude oil industry, none of the terms of the pricing formula are ambiguous. In other words, per common industry standard and usage, the words used in the contact have a clear meaning and understanding. Further, the components included are typical pricing components included in crude oil purchase and sale contracts. The NYMEX near month WTI crude oil contract average daily settlement price is published by many public sources each day. Eighty-Eight's differential for NDL is clearly a differential to be determined by Eighty-Eight to assess the difference in average daily difference in the market value for crude oil in North Dakota delivered for sale in North Dakota during the producing month verses the value of crude oil delivered in Cushing, Oklahoma, for sale under the NYMEX near month WTI crude oil contract in subsequent producing months.[49] Deemed gravity is an accepted pricing

[49] Note that NYMEX WTI is a futures contract so that prices determined during the trading days in any one month are for crude oil deliveries to be made in Cushing, Oklahoma, in the following month, or the second following month, depending on the trading day of interest. The NYMEX future month contract closes for the next following month around the 25th calendar day of each month when NYMEX future month contract for deliveries in the second following month becomes the "prompt" contract.

component found in many other contracts. The agreement to price the crude oil as if it is delivered "EDQ" or in equivalent daily quantities is typically an agreed upon component in crude oil purchase and sale agreements.

73. Certain transportation charges to Newfield are also clearly specified to include pipeline tariff charges (transportation, pump over fees, shrinkage and the like) and, if applicable, any costs associated with trucking the production from lease locations. In effect, the parties agreed to a transportation component over the term of the contract regardless of where the crude was actually shipped after being delivered to EEO. Note that Newfield did not deliver crude oil at or to Guernsey, nor did the terms of the contract require that EEO transport the crude to Guernsey or to any other specific point of sale, or that EEO sell the crude oil on a specific pricing bases or into any specific downstream market. Rather, per the plain language of the contract as understood in the industry, the parties agreed that the transportation component attributable to the Newfield volumes, AFTER determination of the value of the Newfield volumes, would be fixed by the actual trucking costs and the pipeline tariffs to Guernsey, Wyoming, over the five-year primary term of the Agreement. None of this conduct is unusual or out of the ordinary in the crude oil sale and purchase industry.

EIGHTY EIGHT'S DIFFERENTIAL FOR NDL

74. EEO is in the business of buying and selling crude oil in North Dakota and other states. As such, EEO utilizes proprietary, in-house pricing strategies to compete with other crude oil purchasers operating in North Dakota to secure crude oil supplies that are aggregated, stored, blended, and transported for delivery to downstream buyers seeking to fulfill needs for crude oil demand. The proprietary pricing strategies utilized by EEO and other crude oil purchasers are based on the crude oil transportation and storage assets owned and/or controlled by the purchaser, in-house proprietary knowledge about the operational capabilities and the operating costs of these assets, relationships with crude oil suppliers and purchasers, and knowledge of the characteristics of downstream markets. Downstream market considerations include such aspects as demand in certain downstream locations, the costs to transport to downstream locations, control of the capacity to transport to certain

downstream locations, and established business relationships with downstream crude oil purchasers.

75. Eighty Eight's differential for NDL was one of the proprietary market pricing mechanisms offered by EEO to producers seeking access to multiple market disposition alternatives for crude oil produced in North Dakota. The differential was utilized as the pricing bases for contracts with multiple trading partners[50] and was determined from month to month based on EEO's assessment of the North Dakota market for each specific production month. Therefore, Eighty Eight's differential for NDL was identified as, and meant to be, a floating or open differential that moved with changes in the market over time and that required assessment in each and every month of production.

76. As a market maker, EEO is uniquely situated to assess a monthly average differential for crude oil in North Dakota. Various market assessments are made routinely by many industry participants including, but not necessarily limited to, independent pricing services, [51] marketing companies[52] and refiners.[53] EEO negotiates for NDL purchases and sales in North Dakota, and for sales of North Dakota crude oil into export markets on the U.S. East Coast, at Cushing, Oklahoma, on the U.S. Gulf Coast, and in any other markets accessed for clearing the North Dakota crude supply in each producing month. On the basis of such sales, EEO can assess the average value of North Dakota crude production at the point of Newfield's sales,

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[50] Bates Nos. Eighty-Eight 0000164-0000187 and Eighty-Eight 0000202-0000210 and deposition of Gerald C. Herz, April 27, 2017, Page 18, lines 9-21.

[51] Platts assesses the value of oil globally using its Market on Close (MOC) assessment process. The MOC assessment process establishes core standards for how data is collected and published, how data is prioritized by value, and ultimately how data is analyzed in the course of completing Platts assessments. See Platts Methodology and Specifications Guide for Crude Oil, April 2017.

[52] Examples are https://www.plainsallamerican.com/getattachment/cd6dc27b-864a-4c1e-a342-25693dee1615/April-2015-Recap.pdf?ext=.pdf; https://www.shellenergyconnect.com/stusco/ViewBulletin.asp; and Eighty-Eight 000047-000106.

[53] See Flint Hills Resources Domestic Crude Oil Pricing - https://www.fhr.com/products-services/fuels-and-aromatics.

based on the delivery of the crude supplied to multiple markets outside of the region in each production month.

77. As a measure of the difference in value between crude oil delivered in Cushing, Oklahoma, and crude oil delivered at or near the lease in North Dakota but sold in multiple outlets outside of North Dakota, Eighty Eight's differential for NDL should assess the revenue and the associated cost to consummate sales of North Dakota-produced crude oil to multiple markets outside of North Dakota. Eighty Eight's differential for NDL must therefore include assessment of the value of NDL sales in multiple outlets as well as the cost to move the NDL volumes from North Dakota to the associated downstream delivery points. Without proper recognition of both the revenue and the cost associated with downstream sales, the value of NDL barrels delivered in North Dakota for sale in multiple outlets cannot be determined. If, as Ms. Deferrari suggests, Eighty Eight's differential for NDL were to include only the revenue earned from sales that occur at locations downstream of the lease and in multiple sales locations outside of North Dakota without recognition of the costs to transport and deliver the North Dakota crude to those locations, Eighty Eight's differential for NDL would represent the assessment of the market value of North Dakota crude sold in other locations, but not the value of North Dakota crude sold in North Dakota at or nearby the wellhead. Newfield's sale of crude oil to EEO occurred in North Dakota, at or nearby the wellhead, not at multiple outlets outside of North Dakota.

78. As a crude oil marketer, EEO provides direct purchase and sale services for some customers. Customers who contracted with EEO for "back-to-back" purchase of specific crude volumes for sale into specific downstream markets and provided market commitments for such volumes were not included in the assessment of Eighty Eight's differential for NDL. These volumes of NDL were not offered for sale in North Dakota without stipulation as to the downstream transportation mechanism and sales locations. Without EEO's agreement to the terms and conditions of these back-to-back commitments, those volumes may never have flowed to EEO. These committed barrels did not flow into EEO's monthly crude oil portfolio

for sales to multiple outlets, and therefore could not be counted as Eighty Eight's differential for NDL barrels. This arrangement is common in the industry.

79. EEO marketed fixed delivery or "back-to-back" sales to many producers, including Newfield. Newfield later consummated some of these deals with EEO and committed some volumes to location-specific sales.[54] Such contracts did not allow EEO to deliver barrels to any or "all markets" but were specific commitments with specific counterparties. These barrels did not have flexible disposition and were dedicated to specific downstream markets, pricing and contracts. If such barrels were included in the assessment of the Eighty-Eight's differential for NDL, EEO sales would be "double counted" with the sales proceeds firstly attributed under dedicated, back-to-back contracts to which those barrels were committed and then again as contributing to sales of NDL in multiple outlets as such sales varied from month to month. Double counting these sales would treat them as if EEO had been paid for them twice. Inclusion of all of EEO's agreements in both assessments would skew reality, as volumes purchased for delivery under related, dedicated downstream sales commitments were never available for "sale to multiple outlets" and may not have even been delivered to EEO at all without confirmed, back-to-back downstream market commitments.

80. The ability to conduct "back-to-back" sales is important as they allow the midstream marketer to:

    a. Develop new transportation facilities and markets;
    b. Attract new customers;
    c. Develop new markets and sales relationships; and
    d. Provide select markets for customers who want select markets, pricing or outlets.

    Per industry standard, if parties to a contract want specific sales locations included in their differential or for their differential to be limited to sales or deliveries into certain markets, the specific desired pricing components should be included in the language of the contract.

[54] Deposition of Gerald Herz. Page 162.

81. The purchases and sales of undedicated North Dakota crude oil consummated by EEO in each production month were completed after title for the Newfield crude transferred to EEO and after the Newfield volumes were aggregated with other crude oil supplies acquired by EEO in North Dakota. The pool of undedicated crude oil available to EEO was delivered to purchasers seeking crude oil supply in multiple outlets accessible to EEO in each trading month. EEO assessed the NDL differential in each month on the basis of these sales and the associated costs to transport and deliver the crude from or nearby to the wellhead in North Dakota, consistent with industry standard and the Agreement.

82. The range of prices paid by EEO for the purchase of crude oil produced by Newfield and delivered at or near the wellhead in each delivery month under the Agreement are depicted by the red bars in Figure 16 shown below. Note that the overall range of prices paid by EEO varies significantly from month to month, but that the price range falls in-between the posted prices for NDL for delivery at the wellhead and the spot prices for NDL deliveries at regional trading centers located downstream of the producing fields or pools and away from the wellhead in most of the delivery months. The spreads between the posted prices and the spot trading location prices in North Dakota provide an indicator of the average range of the market's assessment of value between those delivery locations. Historical pricing trends provided throughout this report and in Appendix D, document the significant variations in the spot price differentials for North Dakota that were observed throughout the primary term of the Agreement. Given the observed market prices at the time in Figure 16 below and the range of prices EEO paid to Newfield for crude oil purchases under the Agreement, the overall prices paid Newfield for crude deliveries to EEO under the Agreement were competitive with other market prices for crude oil sold and delivered at or near the wellhead in North Dakota over the duration of the Agreement.

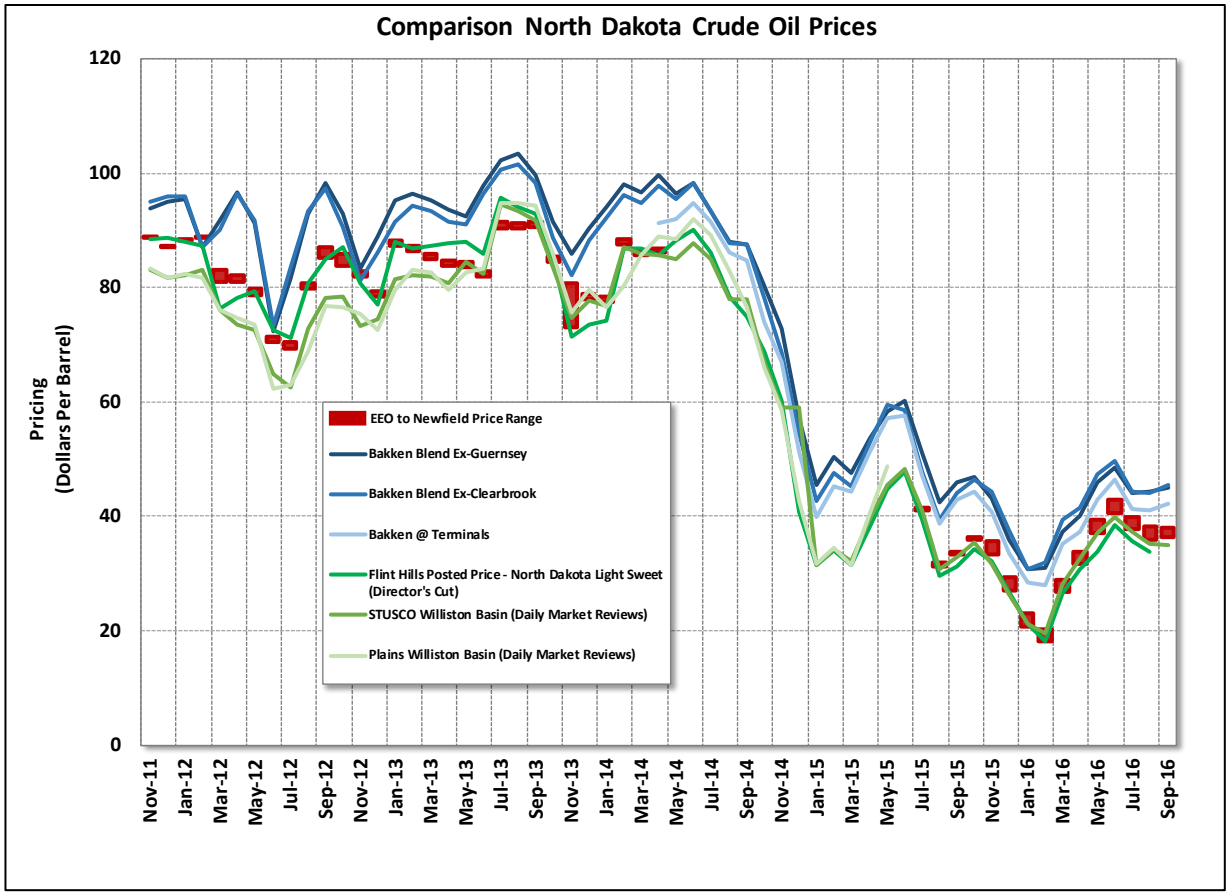

Figure 16: Comparison North Dakota Crude Oil Prices

Sources: Platts U.S. Crude Oil Assessments; company crude oil postings; Pulliam Appendix 2.4; Eighty-Eight 0000211-0000311 and Eighty-Eight 000047-000106

PULLIAM EXPERT OPINIONS

83. Mr. Pulliam presents two damage calculation cases with differing assumptions and different sources of pricing information. The first damages case, Damages Based on Contract Price, relies primarily on the North Dakota sales price information produced by EEO excluding transportation expenses. The second damages case, Damages Based on Market Prices, relies on the average market price calculated from production tax data provided to the State of North Dakota.[55]

[55] Newfield0011399.xlsx; Newfield0011400.xlsx; Newfield0011401.xlsx; Newfield0011402.xlsx; Newfield0011664.xlsx.

PULLIAM CASE I: DAMAGES BASED ON CONTRACT PRICE

84. In the first damages case ("Pulliam Case I"), Pulliam calculates an alternative NDL differential by calculating a weighted average sales price utilizing the extract of contract revenue provided by EEO in the course of discovery for all EEO sales of North Dakota crude, regardless of the EEO contract portfolio in which the sales were made and irrespective of the delivery location associated with each sale. Further, Pulliam Case I ignores transportation costs incurred for the delivery of any barrels exported out of North Dakota on rail prior to delivery. Without rail transportation, the crude oil associated with these sales would have been stranded in North Dakota and not sold. Stranded crude must be stored and therefore the produced crude oil would have had to have alternative storage downstream of the lease or near the lease delivery points where EEO received crude oil from Newfield. For storage downstream of the producing lease, additional costs may have been incurred to lease or otherwise make available storage capacity. Otherwise, Newfield would have had to shut in wells to prevent over-topping working crude oil storage.

85. There are three separate damage periods in Pulliam Case I, with the calculations for each time period utilizing different assumptions. Mr. Pulliam was asked to assume that Newfield would have continued to deliver volumes to EEO from May 2014 to the end of the contract in October 2016, on a ratable basis to fulfill the volume commitment. These are defined by Pulliam as the "but for" volumes. The description of volumes utilized in each time period and the pricing bases used in determining the damages in Pulliam Case I are summarized in Table 2 below.

Pulliam Case I Volume and Price Basis by Time Period

Time Period	*Volume Basis*	*Damages Price Basis*
November 2011 – April 2014	Volumes Newfield delivered under contract	Pulliam NDL differential
May 2014 – June 2015	"But for" volumes Newfield would have delivered under the contact	Pulliam NDL differential
July 2015 – October 2016	Lower of Actual Delivered and "But for" volumes Newfield would have delivered under the contact	Pulliam NDL differential
	Delivery Deficit – difference between "But for" Volumes and Actual Volumes delivered	Pulliam NDL differential
	Delivery Excess – difference between Actual Volumes delivered and "but for" Volumes	Pulliam Average Market Price

Table 2: Pulliam Case I Volume and Price Basis by Time Period

86. For the damages calculated utilizing Pulliam's alternative NDL differential, he assumes that Newfield is owed damages for crude value differences between his calculated value and the values realized by Newfield in each month of the Agreement from November 2011 to October 2016. He opines that Newfield suffered losses even in months that Newfield chose not to deliver under the terms and conditions of the Agreement, when Newfield delivered and sold their crude volumes to other purchasers.

87. Additionally, Pulliam's Case I includes damages in the July 2015-October 2016 period for both the volumes Newfield delivered and sold to other purchasers as compared to the "but for" ratable case and the volumes that Newfield overdelivered as compared to the "but for" ratable volume. A summary of the Pulliam's Case 1 damages and volumes for each time period are included in Table 3 below:

Pulliam Case I Damages and Volume

Time Period	*Volumes Barrels*	*Damages Dollars*
November 2011 – April 2014	2,423,403	$15,329,614
May 2014 – June 2015	998,691	$1,757,383
July 2015 – October 2016	962,265	$1,213,329
	1,182,812	$1,892,907
	184,120	($80,321)
Total	5,751,291	$20,112,912

Table 3: Pulliam Case I Damages and Volume

88. Pulliam also presents an alternative Case I theory with damages calculated utilizing only the volumes as delivered by Newfield to EEO based on the Pulliam alternative NDL differential. This alternative Pulliam Case I is documented in Pulliam's Appendix 1.5.[56]

89. Pulliam's alternative NDL differential value as presented in Pulliam Case I is flawed for the following reasons:

    a. The analyses in Pulliam Case I are based on the illogical notion that EEO would pledge to provide pricing to Newfield for crude delivered at or near the wellhead based on sales that occurred at delivery locations hundreds of miles away without deducting the rail transportation costs necessary to reach those markets and deliver the crude oil. Such an expectation would be outside the industry standard for parties in the crude oil sales and marketing business. The rail transportation costs ranged from $12 to $15 per barrel, while the Agreement specified that EEO profit should be $0.85 per barrel. Such higher-valued downstream sales were consummated in some rail-accessible markets such as those on the U.S. East Coast and the sales prices did not include the potential costs to EEO associated with oil losses, in-transit inventory value gain/loss, inventory carrying costs, and substantial commitment to throughput at Bakken Oil Express, investment in rail terminal at Ft. Laramie, and/or leases on 860 rail cars. On the face of this comparison, no marketer would bet their entire company

[56] Expert Report of Barry Pulliam, Page 15 and Appendix 1.5.

on such a risky proposition without assurances that the incremental cost expenditures necessary to ensure that the crude oil would move, clear the market in North Dakota and provide space for continued well drilling and development would be guaranteed by the producers who stood to lose oil revenue of $100 per barrel in the early period of the contract and $30 per barrel in the later period of the contract. Even in the lower price environment when oil traded at $30 per barrel, the risk of loss to EEO is dwarfed by the $12- to $15-per-barrel transportation cost. The arrangement assumed by Mr. Pulliam is not reasonable, ordinary, or within industry practices.

b. Pulliam has utilized all of EEO's sales in all markets in his calculation. Some of these sales were associated with barrels purchased by EEO under contracts designed for specific downstream markets, on a "back-to-back" basis. The revenues from these sales are solely attributable to the party delivering the specific barrels to EEO, and therefore cannot be part of Eighty Eight's differential for NDL or any other aggregated pool of EEO business.

c. Pulliam's calculation implies that there was unlimited capacity to move additional volumes of crude oil under every other contract in his comparison set and that the movement of additional volumes under such contracts, into the existing transportation infrastructure, and to delivery markets would have had no impact on the price. This is not likely to have been the case in each and every month between November 2011 and October 2016; export capacity out of North Dakota was very limited, especially in the time frame prior to 2013, and rail movements required access to rail terminals and rail cars with sufficient throughput capacity. Pulliam has provided no analyses to confirm that even one more barrel could have been sold, scheduled, or delivered under any of the agreements which he now claims should provide the bases for pricing Newfield's sales.

90. Charles Laudeman testified that the $0.85-per-barrel marketing fee specified in the Agreement represented "A profit margin. A midstream company is not going to go into a

contract without having a profit margin built into it."[57] This is, of course, a reasonable expectation of entities in the crude oil marketing industry. As profit is defined as "revenue less costs of sales,"[58] EEO should have expected to earn approximately $3.9 million for performance under the terms and conditions of the Agreement.

CASE II: DAMAGES BASED ON MARKET PRICES

91. In his second damages case ("Pulliam Case II"), Pulliam analyzes crude values as reported to the State of North Dakota for production tax purposes to calculate an "average market price."[59] The reported values utilized for production tax purposes are filed on ND Form T-12 on which crude oil producers and purchasers are instructed to report values based on the revenue from the first sale less transportation costs.[60] Pulliam compares his calculated "average market price" to the prices paid by EEO to Newfield to determine damages.

92. While Mr. Pulliam has made some attempt to segregate out some of the non-comparable sales on the basis of API gravity difference and transactions that he determined to be between affiliated parties, his "average market price" cannot be relied upon as a price that should have been paid by EEO to Newfield under the Agreement. Mr. Pulliam's attempted calculation of an "average market price" and further, the assumption the "average market price" should have provided the pricing basis for Newfield's barrels is flawed for the following reasons:

    a. Pulliam's analyses imply that the monthly volumes of North Dakota crude oil produced by Newfield and delivered to EEO under the Agreement could have been delivered to other anonymous purchasers during the same production month at the same values realized for sales from other wells in various locations that may or may

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[57] See Deposition of Charles Laudeman, May 10, 2017, Page 158, lines 22-25 to Page 160, lines 1-6.
[58] Merriam-Webster defines profit as "the excess of returns over expenditure in a transaction or series of transactions; especially: *"the excess of the selling price of goods over their cost."*
[59] Expert Report of Barry Pulliam Pages 21 -22 and Appendix 2.5.
[60] North Dakota Reporting Instructions Oil and Gas Taxes, North Dakota Office of State Tax Commissioner. May 2000.

not have had the same economic access to transportation infrastructure as the Newfield wells.

b. Further, the analyses imply that no additional costs would have been incurred to save, store, transport, and deliver the crude oil produced from the Newfield wells to the delivery locations accessed for the actual deliveries under other contracts. This assumption is flawed given the mix of truck and pipeline gathered volumes and the changes in those volumes over time. This assumption is also flawed given that once a well is connected to a pipeline, the crude oil volumes from any given well are somewhat captive to the pipeline interconnections downstream of the gathering point. Therefore, difference in values realized under other contracts or as reported by other producers and purchasers for other wells, even wells in the same field or pool, may be due specifically to differences in location and available gathering infrastructure.

c. Mr. Pulliam utilized the prices reported by producers and purchasers for wells operating in an arbitrary five-mile radius around each of the Newfield wells from which crude oil was delivered and sold to EEO as being representative of an appropriate comparable market sale. As shown on Figure 17 below, this arbitrary radius results in the inclusion of prices from sales that are not comparable to the sales prices paid to Newfield due to geographic barriers and anomalies such as Lake Sakakawea and the Little Missouri River, as well as the relative proximity of particular wells to export pipelines. Additional well location maps are located in Appendix E.

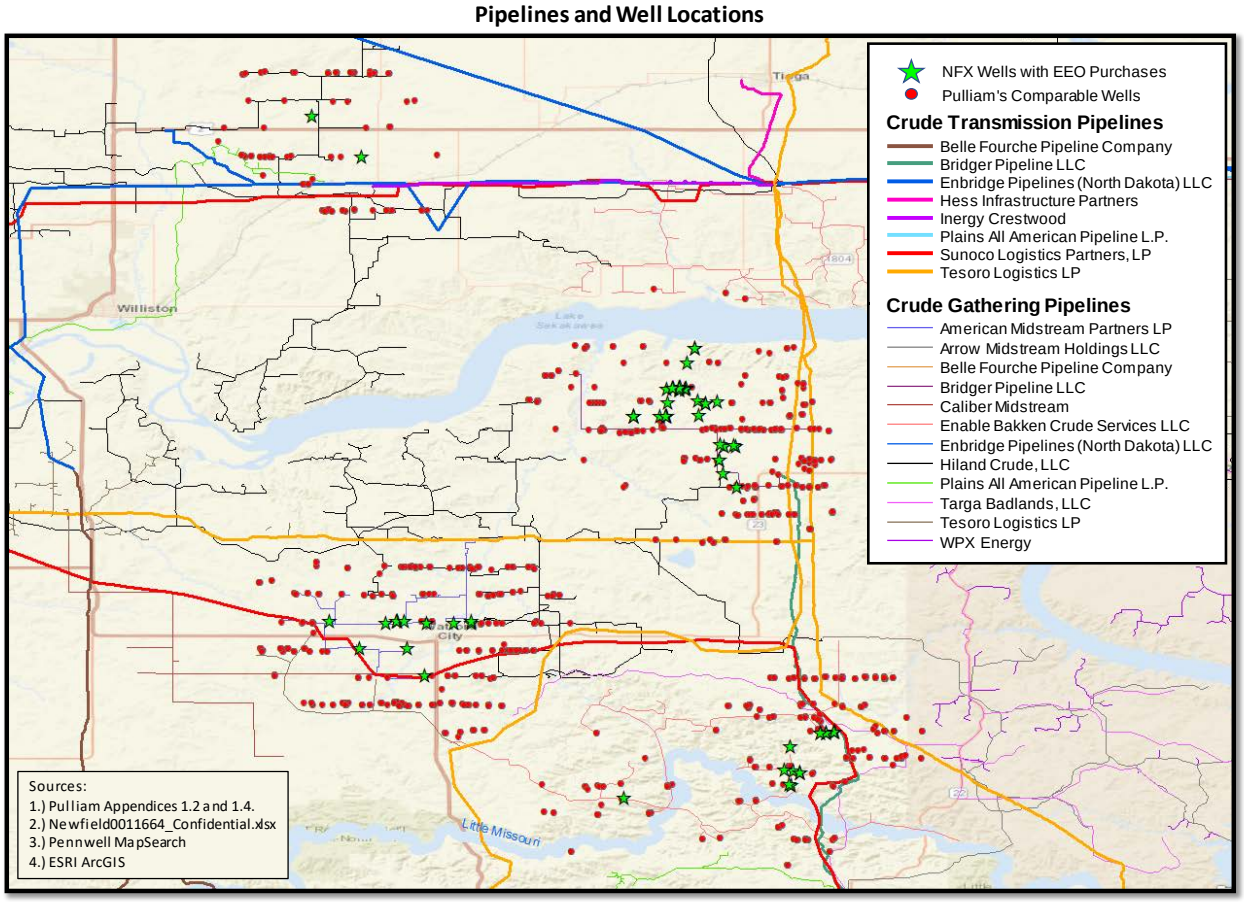


Figure 17: Pipelines and Well Locations

d. Mr. Pulliam confirmed in his deposition that the North Dakota production tax records do not provide an indication of whether the sales he considered as comparable were associated with spot or term contracts.[61] Spot sales are not comparable to sales under long-term contracts, as spot sales reflect the expectations of buyers and sellers on a specific day or with respect to the current trading month and are negotiated to fulfill immediate supply or disposition needs. To be comparable to the prices EEO paid to Newfield under the five-year term contract, the sales prices included in the calculated average market price should be from contracts with a similar contract term

[61] Draft transcript of Barry Pulliam.

length and with similar purpose, i.e., guaranteed takeaway capacity over a period of time, access to multiple markets, and other services.

e. Sales prices reported for production tax purposes to the State of North Dakota do not specify sales location. It is not clear from the reporting whether the prices are all reported on a wellhead basis or whether some of the sales may be reported based on first arms' length sales that occur downstream of the wellhead or lease at a CDP. There is the potential for some producers to incur gathering costs upstream of a CDP, and for such costs to be accounted for as part of the producers' lease operating expenses rather than as transportation costs. These upstream of gathering/transportation costs may not have been deducted from the sales price reported, as they would not have been incurred by the purchaser.

f. Some of the purchases included by Mr. Pulliam as part the market area sales price assessment may have been associated with contracts that include a larger package of wells, some of which are outside of the five-mile radii areas surrounding the Newfield wells for which volumes were delivered and sold to EEO. Prices paid for crude oil sales associated with a large supply volume from many wells may not be comparable to the prices paid under the EEO Newfield contract. As this analysis has not been completed by Mr. Pulliam, and the contract information is unavailable for the wells included in his pricing analyses, it is impossible to confirm that the aggregated sales associated with any of the prices relied upon are comparable to sales under the Agreement.

g. Pulliam's "average market price" is compared to the price paid by EEO to Newfield which is after a marketing fee of $0.85 per barrel has been deducted. The North Dakota production tax data does not include reporting for marketing fees. Therefore, it is impossible to determine whether any of the sales prices included in the analysis were subject to marketing fees, and further whether marketing fees have been deducted from the reported sales prices. Comparison of reported sales that may not contain marketing fee deductions in effect includes as damages some or all of the marketing fee charged by EEO, which was a specific deduction under the Agreement.

h. The range of prices included in the calculation of Pulliam's "average market price" is approximately $10 - $15 per barrel. It is apparent there is wide disparity in the market prices within the arbitrary five-mile radius relied upon by Mr. Pulliam and the observed range of prices reflects not only the variation in gathering charges well-to-well, but is also consistent with the price differentials between pipeline-transported and rail-transported barrels exported to multiple markets outside of North Dakota during the period from 2011 to 2016.[62]

93. For these reasons, I do not believe the "average market price" calculated by Mr. Pulliam represents a price that should have been paid for the crude delivered to EEO by Newfield under the Agreement.

94. Despite the short-comings of Pulliam's area sales price calculations and the arbitrary five-mile radius utilized in the assessment, comparison of the range of sales prices in the production tax database utilized by Pulliam to the range of prices received by Newfield from EEO, supports my opinion that the overall prices paid Newfield for crude deliveries to EEO under the Agreement were competitive with other market prices for crude oil sold and delivered at or near the wellhead in North Dakota over the duration of the Agreement. Figure 18 below provides the average sales price calculated by Pulliam, the range of the prices in the production tax database relied upon by Pulliam, and the range of the prices paid to Newfield by EEO.

[62] See Newfield 0011399-11402 and Newfield 0011664.

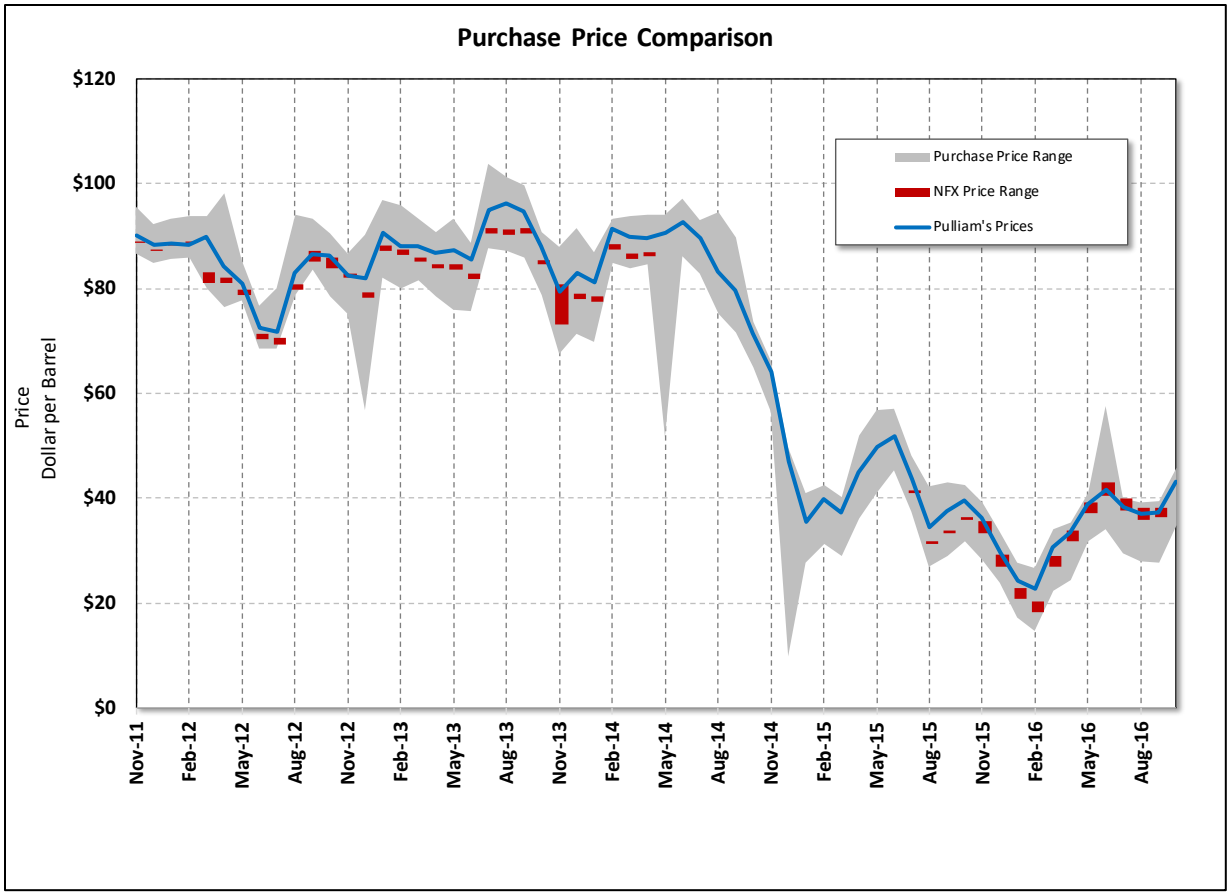


Figure 18: Purchase Price Comparison

Sources:
1. **Newfield0011399-11402 (Severance Tax Data)**
2. **Newfield0011664 (Pulliam's Comparables)**
3. **Pulliam's Appendix 2.4; Eighty-Eight 0000211-0000311 (NFX Price Range)**
4. **Pulliam's Appendix 2.5 (Pulliam's Prices)**

APPENDIX A – LESA S. ADAIR QUALIFICATIONS AND PUBLICATIONS

LESA S. ADAIR

Education:

B.S. Chemical Engineering - 1983
Oklahoma State University
M.B.A. Finance - 1993
Southern Methodist University

Experience:

Pearson Adair & Co.	
Founding Partner	January 2016 - Present
Advancial Federal Credit Union, Alternate Director	January 2013 – Present
The Westwood School Board of Directors	June 2013 – Present
Board President	August 2014 – Present
Legacy Committee Representative	June 2013 – August 2014
Muse, Stancil & Co.	1992 - 2016
Chief Executive Officer	
Chief Financial Officer	
Board of Directors	
Executive Vice President	
ARCO Oil and Gas Company	1982 - 1992
Senior Crude Oil Marketing Representative	
Senior Analytical Engineer	
Start-Up Coordinator	
Operations Supervisor	
Operations Engineer	
Mechanical Supervisor	
Gas Engineer	
Junior Engineer	

Professional Registration:

Professional Engineer (P.E.) Oklahoma #15232 (1988)
Professional Engineer (P.E.) Texas #72456 (1992)

Professional Organizations:

American Institute of Chemical Engineers
National Society of Professional Engineers

Summary of Experience:

Lesa has worked in the energy industry for more than 30 years completing assignments encompassing the entire energy value chain. Beginning her career with ARCO, she was responsible for reservoir engineering evaluations associated with exploration and development projects, assessment of the economic value of acquisition and divestiture activities, analysis of natural gas shut-in strategies, pipeline/plant engineering design, pipeline/plant construction and operations management of existing production properties. Her final assignment with ARCO was in domestic crude oil trading and marketing. In the crude trading group, Lesa evaluated transportation logistics, analyzed the operations of refineries, assessed the commercial aspects of potential mergers and asset trades, and formulated options and futures strategies.

Since joining Muse In March 1992, Lesa has been involved in a wide variety of assignments and is frequently retained to advise clients on both technical and commercial issues related to mergers, asset transactions, project

development and start-up, bankruptcy/workout, and dispute resolution. She has experience in the transportation, processing, refining, marketing, and electrical generation sectors. From 1992-2016, Lesa served as Muse Vice President, Corporate Treasurer, CFO and CEO. She served as a member of the Muse Board of Directors from 1998 until she departed the firm in 2016. In 2016, Lesa joined Kyle Pearson to form Pearson Adair & Co.

Representative Major Project Experience:

1. **Expert Advisory to Bank Group, Market Analyses/Evaluation/Assessment of Business Plans for Large Integrated Mid-Stream –** Retained by Creditor Group to provide market analyses, evaluation, and assessment of crude oil gathering/trading, natural gas processing, natural gas storage, asphalt manufacturing, and liquefied petroleum gas business segments for the SemGroup of assets. Work included analysis and assessment of reorganization plans, evaluation of asset market positioning, and assessment of resources required to emerge from bankruptcy. Scope of work included management interviews, participation in creditor group meetings, independent assessment of markets, and determination of potential credit requirements for reorganized business segments.

2. **Expert Testimony, World-Scale Petrochemical Plant Property Loss –** Retained by counsel for insurer to assess damage, repair and restart of major integrated U.S. Gulf Coast petrochemical facilities. Entire processing complex experience sudden shutdown due to fuel gas quality excursion resulting in damage to processing equipment. Maintenance, repair and restart activities were assess and evaluated.

3. **Intervenor Advisory, U.S. Bankruptcy Court** – Retained to provide assessment of crude oil, natural gas and water gathering systems and rates for midstream provider in North Dakota. Provided expert testimony in case-in-chief and rebuttal with respect to bankruptcy of counterparty with operations in North Dakota.

4. **Asset Valuation, Refinery Transaction Upper Midwest U.S.** – Retained to evaluate existing refining assets, future crude supply and product disposition for small refinery and related assets in upper midwestern U.S. Provided assessment of existing refinery units, possible future refinery configurations, expected sustaining capital and possible expansion capital, historical crude supply/price relative to expected changes in market given expected infrastructure, and market requirements for forecasted refinery products. Evaluation included cash flow and comparable sales analyses.

5. **Business Interruption Claim, Major U.S. Refinery, Texas –** Provided an independent assessment of the valuation of a business interruption claim for a major U.S. refiner due to fire in a Texas refining complex that shut down operations for extended period of time. Analyses included assessment of West Texas crude oil markets, analyses of any benefit to refiner's other Texas facilities, additional costs to supply customers during the outage and validation of duration of outage.

6. **International Arbitration Kazakhstan Gas and Condensate Conditioning and Processing Facility –** Retained by owner/operator to evaluate design and construction as well as construction contracts for grassroots field facilities located in northwestern Kazakhstan. Provided assessment of project execution and expert testimony in international arbitration proceedings.

7. **Expert Testimony Natural Gas, LPG, And Olefins Underground Storage Loss, Major U.S. Gas Transmission Pipeline Company** – Retained to provide expert opinions with respect to the technical capabilities and commercial value of adjacent underground storage caverns located near the Henry Hub in Louisiana. Completed evaluation of technical capabilities of storage facilities for natural gas, LPG, and Olefins in order to assess losses associated with the catastrophic failure of one cavern. Valuation included assessment of market conditions such as supply/demand and pricing

prior to the incident, at the time of the incident, and in the future. Provided expert opinions for case-in-chief and rebuttal as well as deposition testimony. Parties settled prior to trial.

8. **Evaluation of Crude Oil Gathering Operations** – Retained by creditors to evaluate the ongoing operations of a crude oil gathering and marketing company operating in conjunction with a merchant refiner located in the southwestern U.S. Work included the assessment of crude oil gathering pipeline operations, trucking operations, system inventory, contract analysis, and risk management activities. Completed a detailed economic analysis of historic profitability and constructed pro forma analysis of business including new venture opportunities.

9. **Plant and Pipeline Project Development/Advisory –** Retained by investment fund to review engineering design, project management, construction, commissioning, startup and certification of grassroots gas gathering and processing plant project in the U.S. Midcontinent. Assignment included assessment of initial project design, project schedule and cost estimates, procurement, construction contracts, installation, commissioning, design, certification and acceptance of gas gathering and processing facilities as well as gas and NGL pipelines/metering facilities to interconnect with existing mainline transportation systems.

10. **Expert Testimony Natural Gas Gathering and Processing Contract Dispute, South Texas –** Retained by integrated international petrochemical manufacturer with gas processing and olefins manufacturing capacity in South Texas to evaluate claims made by gas gatherer and marketer under gas processing and product sales contract. Completed evaluation of large wet gas gathering system, gas supplies, gas quality, measurement, and gathering operations as well as gas plant processing operations including compression, treating, processing and product qualities. Provided analyses and conclusions with respect to evaluations and damages model of other experts and offered expert testimony at deposition and trial.

11. **Expert Testimony, Market Analyses/Advisory** – Provided testimony before the Alaska State Legislative Budget and Audit Committee regarding the development of the Alaska Natural Gas Pipeline Project and the possibilities for in-state utilization of natural gas and natural gas liquids produced from the pipeline.

12. **Expert Testimony, Gas Processing Contract Dispute** – Retained to interpret portions of gas processing contract, formulate expert opinions, and provide expert testimony regarding the plant facilities, the gas gathering facilities, recovery of natural gas liquids and condensate, and accounting/allocation of natural gas liquids and condensate.

13. **Business Strategy, Management of Royalty Trust** – Provided business management, administration, and oversight for $100 million oil and gas royalty trust. Retained by owners of the trust as agent of the General Partner of the trust to manage day-to-day business functions, confirm production, invoice and confirm payments, and administer oil and gas marketing contracts as necessary. Managed the transition of the agent from Enron-affiliated management post-bankruptcy.

14. **Operations/Maintenance Supervisory –** Completed assignments in various supervisory positions for unit revamp projects and major green field projects that included company representative responsible for construction monitoring, construction completion review, safety monitoring, punch list assessment, commissioning planning/execution, startup planning/execution, handover and negotiation of completion of construction activities during demobilization and after contractor exit for projects from $ 10 MM to $100 MM+.

15. **Financing Advisory –** Retained by bank group to evaluate supply strategy and crude oil hedging program for independent U.S. refiner. Completed assessment of prior trading gains/losses, analyzed need for future hedging activities, and advised counsel in construction of loan covenants to minimize unhedged trading activities.

16. **Privatization** – Provided due diligence, technical advisory and valuation services to investment bank retained in sale of European refining and petrochemical assets. Assets included modern, integrated refining operations and terminals located in the Mediterranean as well as inland petrochemical manufacturing facilities.

17. **Bankruptcy** – Provided technical and economic analyses, asset valuations, and feasibility analyses for bank group relative to refining, terminalling, and marketing assets located on the U.S. West Coast and U.S. Gulf Coast.

18. **Project Development Advisory** – Retained by the Department of Revenue and the Department of Natural Resources to analyze and provide input regarding the negotiations with potential developers of the Alaska Gas Pipeline. Analyzed potential project development scenarios, including evaluation of product market supply/demand, expected gas processing scenarios and commercial terms for gas processing and product sales. Provided natural gas liquids pricing forecast advice and audited project financial models.

19. **Gas to Liquid ("GTL") Project Development –** Retained by technology providers and project developers to evaluate technology, project technical and economic feasibility, product quality and potential markets for GTL products. Provided advisory services with respect to the development of project and joint venture business plans as well as financial assessment of proposed GTL facility development in North America and the Caribbean, including projects focused on supply in to export markets.

20. **Valuation, Development Bankruptcy Proof of Claim** – Retained by Enron counterparties in commodity and interest rate swap contracts to determine damages and assess amounts owed by the Enron estate to the partnership.

21. **Expert Testimony, Market Valuation of Wellhead Natural Gas** – Retained to evaluate the market value of unprocessed natural gas at the wellhead in southwestern Wyoming. Analyzed the market for raw natural gas in the producing region, evaluated the capabilities of gas processing plants in the area, evaluated the residue gas and natural gas liquids markets, and assessed the processing costs for the natural gas to formulate expert opinion regarding the best method to determine the market value of the unprocessed gas at the wellhead. Appeared in numerous cases before the State Board of Equalization in Wyoming providing expert testimony on behalf of various producers with gas production and processing assets in southwest Wyoming.

22. **Business Strategy, Negotiation of Royalty Provisions in Producing Lease** – Retained by royalty trust to evaluate proposed gas production and gas processing operations for very sour gas production in central Texas. Evaluation included review of the existing field and plant facilities, expected gathering and processing costs, and gas processing economics. Provided recommendations regarding commercial terms as proposed by the operator and relative value implications for the royalty trust.

23. **Expert Testimony, Valuation of Overriding Royalty Interest** – **Equatorial Guinea** – Retained to analyze and formulate expert opinions regarding the methodology being utilized by Integrated International Oil and Gas Company to determine the market value of natural gas liquids and condensate being produced in Equatorial Guinea for export. Analyses included completion of an audit of prior payments made to the holder of the Overriding Royalty Interest as well as evaluation of the fair market value of the products based on netback methodology.

24. **Consulting Expert, Gas Processing Cost and Fuel Allowances** – Retained as a consulting expert in dispute between producer and royalty trust regarding fuel and processing losses/allowances as allocated by the producer for gas produced in south Texas. Evaluation included review of existing field and plant facilities, capital expenditures for the initial project development, capital expenditures associated with subsequent project modifications, historical facility operating costs,

fuel utilization, line losses and unaccounted for gas, and development of expectations regarding future field and plant operations.

25. **Consulting Expert, Gas Processing Contract Negotiation** – Retained by producer to provide economic evaluation of existing gas processing contract and recommend potential changes to enhance future economic return for producer.

26. **Consulting Expert, Gas Processing Contract Audit** – Retained by producer to evaluate gas settlement under existing contract and evaluate potential contract compliance issues. Resulted in identification of contract compliance issues and subsequent audit exceptions that led to producer's recovery of proceeds.

27. **Expert Testimony, Private Arbitration Gas Processing** – Retained to formulate expert opinions regarding a gas processing dispute involving offshore gas processed onshore in southern Louisiana. Provided technical/operational expertise and evaluated the commercial aspects of the contract, including assessment of damages.

28. **Operational Evaluation** – **South Texas** – Retained by a royalty interest owner to provide expert testimony and damage estimates associated with oil, gas, and condensate production in South Texas. The project included operational and financial audits of ongoing and historical operations. The review encompassed field and plant operations including: (1) gas measurement and gathering, (2) gas processing, (3) crude, condensate, and NGL transportation, and (4) crude, condensate, gas, and NGL marketing.

29. **Prudhoe Bay Royalty Litigation** – Named as rebuttal witness, filed expert testimony, and provided consulting support in a royalty dispute involving Prudhoe Bay gas processing facilities and natural gas liquids recovery. Testimony involved review and rebuttal of defendants' expert testimony, proposed cost allocation methodologies, detailed process engineering studies, and overall Prudhoe Bay unit issues.

30. **Valuation of Integrated Field Services and Gas Distribution Companies –** Retained to provide an assessment of the value of several integrated companies providing crude oil and gas gathering services, gas compression, gas supply, gas transmission, and local distribution services to customers in East Texas and Louisiana. Valuation was completed for potential investor in conjunction with the purchase of an equity stake and private placement of debt.

31. **Expert Testimony, Power Generation** – Provided expert testimony in a dispute between a regional power generation and distribution company and a local cogeneration company. Work included evaluation of capacity and output potential of electrical generation equipment located in the northwestern U.S.

32. **Major Project Evaluation, Gas Processing** – Completed a review of the technical feasibility and projected investment performance for the $45 million expansion of a gas production and processing project in Alberta, Canada. Performed extensive cash flow analysis of field/plant operations and assisted in the preparation of the private placement memorandum to assist in the financing of the project expansion.

33. **Asset Appraisal** – Retained as expert to provide an appraisal of gas processing assets located in East Texas. Provided a preliminary assessment of the value of the assets for ad valorem tax purposes; analysis included use of the income, cost, and market approaches to value.

Publications:

1. "U.S. Condensate Stabilizer and Splitter Capacity"
   Argus Condensate and Naphtha Markets Conference
   October 29, 2015

2. "Market Update"
   ENGlobal Central States Refining Conference
   September 4, 2015

3. "The Economics of GTL"
   GTL Technology Forum 2015, July 29, 2015

4. "Gas Market Overview"
   2014 Women's Global Leadership Conference in Energy
   November 4, 2014

5. "Western Canadian Diluent Demand and Source of Supply"
   Argus Canadian NGL Markets 2014
   October 6, 2014

6. "NGL Production Outlook and Imbalanced Markets"
   Argus Americas LPG Summit: Infrastructure Decisions Bringing Liquids to Markets
   February 6, 2014

7. "Evolving Light Liquids Markets"
   Adam Energy Forum
   May 2, 2013

8. "Impact of Shale Production on Canadian Diluent Pricing: Will Bakken Liquids Production Change the Economics of Diluent"
   Argus Americas LPG Summit: Opportunities in the Export Markets
   February 8, 2013

9. "GTL - un nuovo mercato per I produttori di gas"
   AGI Energia
   October 31, 2012

10. "North American NGL Supply and Demand"
    Platt's 5th Annual Appalachian Gas Conference
    October 15, 2012

11. "Analysis Shows GTL Viable Alternative for US Gas Producers"
    Oil & Gas Journal
    August 6, 2012

12. "Eagle Ford Shale – Where Are All Those Liquids Gonna Go?"
    Mapping Midstream's Future-Gas Processors Association 2012 Conference
    April 2012

13. "Gas-To-Liquids – Now a Viable Alternative Gas Processing Strategy"
    Mapping Midstream's Future-Gas Processors Association 2012 Conference
    April 2012

14. "Eagle Ford Impacting Liquids Market"
American Oil & Gas Reporter
March 2012

15. "Gas-To-Liquids: A Viable Economic Alternative"
Argus North American Gas Markets 2012 Conference
March 2012

16. "Infrastructure Development and Market Impact"
Argus North American Gas Markets 2012 Conference
March 2012

17. "Transportation Infrastructure Impact on Supply & Demand"
Argus Shale Liquids and Gas Summit Conference
May 2011

18. "Natural Gas, Focus on Midstream, Part I: Overview of the Gas Processing Business"
4th Annual Gas and Power Institute
October 20-21, 2005

19. "High NGL, Naturals Gas Prices Make Processing Margins More Volatile"
Oil & Gas Journal
Week of September 27, 2004, p. 58

20. "US Gas Processing Profitability Statistics"
Oil & Gas Journal
Week of May 21, 2001, p.54

21. "North American Crude Pricing Dynamics – The New Fundamentals"
North American Petroleum Accounting Conference
May 2001

22. "Gas Processing "101" Technology and Commercial Issues"
National Association of Royalty Owners
October 26, 2001

23. "U.S. Product Market Dynamics - Reflecting on the Past – Characterizing the Future"
American Petroleum Institute Pipeline Conference
April 2001

24. "Crude Oil Pricing - A Marketer's Perspective"
North American Petroleum Accounting Conference Proceedings
May 1997

25. "Crude Oil Pricing - A Historical Perspective"
National Association of Royalty Owners
1996 Round-Up Proceedings
November 1996

APPENDIX B – LESA S. ADAIR LISTING OF EXPERT TESTIMONY

LESA S. ADAIR, P.E.

Expert Witness Appearances:

1. **Ralph Redfeather, et al vs. Blue Marlin Tool Co., Inc.,** Case No. 612803, Superior Court of the State of California, For the County of Orange.

2. **State of Texas vs. Amoco, et al.,** Case No. 95 – 08680, 345th Judicial District Court of Travis County, Texas.

3. **March Point Cogeneration Company vs. Puget Sound Energy, Inc.,** Case No. C95-1833RR, U.S. District Court, Western District of Washington.

4. **Howell Petroleum Corporation, et al vs. Shore Oil Co. et al,** Cause No. 95-037180, 113th District Court of Harris County, Texas. Consolidated with #95-037970 Howell Petroleum Corporation, et al vs. Tenexco Inc., et al in the 151st District Court of Harris County, Texas.

5. **Chevron U.S.A. Inc. vs. GPM Gas Corporation,** Civil Action No. MO-97-CA-199, U.S. District Court, Western District of Texas, Midland – Odessa Division.

6. **PRIVATE ARBITRATION: Enterprise Gas Processing, LLC v. Venice Energy Services Company, LLC and Dynegy Midstream Services,** 2002

7. **SEVERANCE TAX APPEAL, PAINTER PLANT/FIELD**: Before the State Board of Equalization for the State of Wyoming, In the Matter of the Appeal From a Change of Valuation Method Decision By The Mineral Division of the Department of Revenue, Docket Nos.: 2000-149 (Union Pacific Resources Company), 2000-150 Chevron U.S.A., Inc., 2000-155 Amoco Production Company (Painter Field); AND In the Matter of the Appeal of Chevron U.S.A., Inc., From a Notice of Valuation for Taxation Purposes Decision of the Minerals Division of the Department of Revenue, Docket No. 2001-113; AND, In the Matter of the Appeal of Amoco Production Company From A Notice of Valuation For Taxation Purposes Decision of the Minerals Division of the Department of Revenue, Docket No. 2001-150, 2002

8. **SEVERANCE TAX APPEAL, WHITNEY CANYON PLANT/FIELD**: Before the State Board of Equalization for the State of Wyoming In the Matter of the Appeal From a Change of Valuation Method Decision By The Mineral Division of the Department of Revenue, Docket Nos.: 2000-147 (Union Pacific Resources Company), 2000-151 Chevron U.S.A., Inc., 2000-154 Amoco Production Company; AND In the Matter of the Appeal of Chevron U.S. A., Inc., From a Notice of Valuation for Taxation Purposes Decision of the Minerals Division of the Department of Revenue, Docket No. 2001-114; AND, In the Matter of the Appeal of Amoco Production Company From A Notice of Valuation For Taxation Purposes Decision of the Minerals Division of the Department of Revenue, Docket No. 2001-149, 2002

9. **SEVERANCE TAX APPEAL, CARTER CREEK FIELD**: Before the State Board of Equalization for the State of Wyoming In the Matter of the Appeal From a Change of Valuation Method Decision By The Mineral Division of the Department of Revenue, Chevron U.S.A., Inc. Before the State Board of Equalization for the State of Wyoming In the Matter of the Appeal of Chevron U.S.A., Inc. from a Change of Valuation Method Decision by the Minerals Division of the Department of Revenue Docket No. 2000-152; AND In the Matter of the Appeal of Chevron, USA, Inc. from a Notice of Valuation for Taxation Purposes Decision of the Minerals Division of the Department of Revenue, Docket No. 2001-112, 2002

10. **GENERAL GAS**: General Gas Company, LP vs. Duke Energy Field Services, LP, The United States District Court For The Northern District Of Texas, Amarillo, Texas, Civil Action No. 2:01-Cv-351-J, 2002

11. **CONOCO v. the CITY OF COMMERCE CITY, COLORADO**: Conoco, Inc. v. Roger Tinklenberg, et al, District Court, Adams County, State of Colorado, Case No. 02 CV 2084, Division C, 2003

12. **MANNA PETROLEUM SERVICES L.P., d/b/a/ MANNA CONTRACT SERVICES v. AMERICAN PROCESSING, L.P. AND ONEOK TEXAS FIELD SERVICES, L.P.,** et al, Case No. 31,485 in the District Court of Gray County, Texas, 223rd Judicial District, 2004

13. **SEVERANCE TAX APPEAL, WHITNEY CANYON PLANT/FIELD**: Before the State Board of Equalization for the State of Wyoming In the Matter of the Appeal From a Change of Valuation Method Decision By The Mineral Division of the Department of Revenue (Production Year 2001, Whitney Canyon), Docket No. 2002-54, 2004

14. **F.T. BARR V. CMS ENERGY CORP**., et al, 333rd District Court of Harris County, Cause No. 2001-61529.

15. **SEVERANCE TAX APPEAL, CARTER CREEK PLANT/FIELD**: In the matter of the appeal of Chevron U.S.A. Inc., From a Notice of Valuation for Taxation Purposes by the Mineral Tax Division of the Department of Revenue (Production Year 2002, Carter Creek), Docket No. 2003-64

16. **SEVERANCE TAX APPEAL, WHITNEY CANYON PLANT/FIELD**: In the matter of the appeals of Chevron U.S.A. Inc., From Notices of Valuation for Taxation Purposes by the Mineral Tax Division of the Department of Revenue (Production Year 2002, Whitney Canyon), Docket No. 2003-65

17. **GMX RESOURCES, INC., v. DUKE ENERGY FIELD SERVICES, LP AND RME PETROLEUM COMPANY (Formerly known as Union Pacific Resources Company)**: United States District Court for the Western District of Oklahoma, Case No. CIV-03-1291-C

18. **SEVERANCE TAX APPEAL, CARTER CREEK PLANT/FIELD:** In the matter of the appeal of Chevron U.S.A., INC., From a Notice of Valuation for Taxation Purposes by the Mineral Tax Division of the Department of Revenue (Carter Creek)

19. **State of Alaska, Legislative Briefing, Joint Session, Alaska Natural Gas Pipeline License,** June 2008

20. **PRIVATE ARBITRATION: Denbury Onshore, LLC v. Crosstex Energy Services, L.P., Crosstex CCNG Processing LTD., Crosstex North Texas Gathering L.P., and Crosstex Gulf Coast Marketing, LTD.,** 2009

21. **23RD Judicial District Court-Parish of Assumption-State of Louisiana – Oil Insurance Limited v. The Dow Chemical Company, Dow Hydrocarbons & Resources, Inc., Frank's Case Crew and Rental Tools, Inc., Grey Wolf Drilling company, LP,** 2010

22. **CIVIL DISTRICT COURT FOR THE PARISH OF ORLEANS, STATE OF LOUISIANA, No. 2001-20936, DIVISION G, SECTION 11, CYNTHIA BRIDGES, SECRETARY DEPARTMENT OF REVENUE, STATE OF LOUISIANA VERSUS PRODUCTION OPERATORS, INC,** 2010

23. **44th JUDICIAL DISTRICT COURT, DALLAS COUNTY, TEXAS, CAUSE NO. 09-08122, *Susan Elizabeth McRae and Susan Jane McRae v. Cohort Energy Company,*** 2011

24. **COMMONWEALTH OF KENTUCKY, FLOYD CIRCUIT COURT, DIVISION II, CIVIL ACTION NO. 09-CI-00731, O&G ENERGY, LLC and THE COURTLAND COMPANY, LLC PLAINTIFFS v. ENERGY MANAGEMENT & SERVICES COMPANY, T. DALE HONE AND PETER GRIMES DEFENDANTS,** 2011

25. **CLEAN AIR COUNCIL, Appellant, v. COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF ENVIRONMENTAL PROTECTION, Appellee, and MARKWEST LIBERTY MIDSTREAM and RESOURCES, LLC,** 2012

26. **SUPERIOR COURT OF THE STATE OF CALIFORNIA FOR THE COUNTY OF LOS ANGELES, CENTRAL CIVIL WEST, IN RE SESNON FIRE v SOUTHERN CALIFORNIA GAS COMPANY AND RELATED CASES,** 2012

27. **MAGNUM HUNTER PRODUCTION, INC. and EUREKA HUNTER PIPELINE, LLC, and others similarly situated, Claimant, v. SEMINOLE ENERGY SERVICES, LLC and SEMINOLE GAS COMPANY, LLC, Respondents, PRIVATE ARBITRATION,** 2013

28. **LONDON COURT of INTERNATIONAL ARBITRATION, ARBITRATION NO. 122216, EXTERRAN KAZAKHSTAN LLP v. ZHAIKMUNAI LLP,** 2013

29. **SUPERIOR COURT OF THE STATE OF CALIFORNIA, COUNTY OF PLACER, ENERGY 2001, PLAINTIFF vs PACIFIC GAS AND ELECTRIC COMPANY; SHAW ENVIRONMENTAL, INC.,; AND DOES 1-100, Defendants, Case No. 0028646**, 2013

30. **JAMS ARBITRATION, CASE NO. 1200047194, U.S. FULL SERVICE ENERGY, LLC, CLAIMANT VS. TRICOR ENERGY, LLC, RESPONDENT.** 2013

31. **DISTRICT COURT OF OCHILTREE COUNTY, TEXAS, 84TH JUDICIAL DISTRICT, MID-AMERICA PIPELINE COMPANY, LLC v PVR GAS PROCESSING LLC AND CONNECT ENERGY SERVICES LLC, CAUSE NO. 13,584 and PVR GAS PROCESSING LLC AND CONNECT ENERGY SERVICES, LLC v MID-AMERICA PIPELINE COMPANY,LLC.** 2014

32. **DISTRICT COURT OF LIBERTY COUNTY, TEXAS, 253rd JUDICIAL DISTRICT, HAYWOOD WI UNITS, LTD., Plaintiff, v. B&S DUNAGAN INVESTMENTS, LTD., ET AL., Defendants, v. CRIMSON EXPLORATION INC. AND CRIMSON EXPLORATION OPERATING, INC., Intervenors.** 2014

33. **DISTRICT COURT OF DALLAS COUNTY, TEXAS, 191ST JUDICIAL DISTRICT, CAUSE NO. DC-13-02687, SOUTHCROSS MARKETING COMPANY Ltd. v FORMOSA HYDROCARBONS COMPANY, INC.**, 2014

34. **UNITED STATES DISTRICT COURT, WESTERN DISTRICT OF OKLAHOMA, (1) SUNDANCE ENERGY OKLAHOMA, LLC, d/b/a SEO, LLC, Plaintiff, v. (1) DAN D DRILLING CORPORATION, Defendant. 2014**

35. **XTO ENERGY INC., A DELAWARE CORPORATION, PLAINTIFF, v QEP FIELD SERVICES COMPANY, A DELAWARE CORPORATION, DEFENDANT. AND RELEVANT COUNTER AND CROSS CLAIMS, THIRD JUDICIAL DISTRICT COURT IN AND FOR SALT LAKE COUNTY, STATE OF UTAH, CIVIL NO. 140900709.** 2016

36. **EMERALD OIL, INC., et al., Debtors, Chapter 11 Case No. 16-10704 (KG) (Jointly Administered)/EMERALD OIL, INC., et al., Plaintiffs, v. DAKOTA MIDSTREAM , LLC; DAKOTA ENERGY CONNECTION, LLC; AND DAKOTA FLUID SOLUTIONS, LLC F/K/A MESA OIL SERVICES, LLC, Defendants. Adversary Proceeding No. 16-50998, UNITED STATE BANKRUPTCY COURT FOR THE DISTRIC OF DELAWARE,** 2016

37. **SWEPI LP vs. TALISMAN ENERGY USA, INC., IN THE DISTRICT COURT OF MONTGOMERY COUNTY, TEXAS, 410th JUDICIAL DISTRICT,** 2016

APPENDIX C – LISTING OF DOCUMENTS AND DATA REVIEWED

Appendix C
List of Documents Relied Upon

Date	Document	Beginning Bates	Ending Bates
03/21/17	Answer to Second Amended Complaint	No Bates	No Bates
03/07/17	Second Amended Complaint	No Bates	No Bates
12/20/11	88 - Crude Oil Volume Commitment Sales Agreement with Newfield Production	Eighty-Eight 0001933	Eighty-Eight 0001939
11/21/16	88's First Set of Discovery Requests	No Bates	No Bates
01/18/17	88's Responses to Plfs First Set of Interrogatories	No Bates	No Bates
11/08/16	Newfield's First Set of Interrogatories	No Bates	No Bates
02/03/17	Newfield's Responses to 88's First Set of Discovery Requests	No Bates	No Bates
03/02/17	88's Second Set of Discovery Requests	No Bates	No Bates
04/03/17	Newfield's Objections and Responses to 88's 2nd Set of D Requests	No Bates	No Bates
03/10/17	88's Third Set of Discovery Requests	No Bates	No Bates
04/10/17	Newfield's Objections and Responses to 88's Third Set of Discovery Requests	No Bates	No Bates
03/27/17	EA Sales Spreadsheet-0003206 Replacement (Interrogatory #11)	No Bates	No Bates
07/09/10	Tad True Presentation - Rocky Mountain Crude Oil Market Dynamics	Newfield0006910	Newfield0006935
2011	0003198	0003198	0003198
2012	0003199	0003199	0003199
2013	0003200	0003200	0003200
2014	0003201	0003201	0003201
2015	0003202	0003202	0003202
2016	0003203	0003203	0003203
Various	Confidential Eighty-Eight 0000107-0000153 (FERC 36 Tariffs Folder) / Bridger Pipeline Tariff	Eighty-Eight 0000107	Eighty-Eight 0000129
Various	Confidential Eighty-Eight 0000154-0000163 (FERC 569 Tariffs Folder) / Butte Pipeline Company	Eighty-Eight 0000154	Eighty-Eight 0000163
Various	Confidential Eighty-Eight 0000211-0000311 (Lease Pricing Worksheets Folder)	Eighty-Eight 0000211	Eighty-Eight 0000311
05/10/17	Laudeman, Charles Deposition	No Bates	No Bates
05/25/17	Deferrari, Robin Deposition	No Bates	No Bates
06/26/17	Expert Report and Appendices of Barry Pulliam Econ ONE Research Inc.	No Bates	No Bates
Unknown	Newfield0011664_Confidential - Well List	Newfield0011664	Newfield0011664
04/28/17	Barbara True Deposition and Exhibits	Various	Various
05/22/17	Gerald Herz Deposition and Exhibits	Various	Various
06/27/17	Plaintiff Newfield Production Company's Expert Disclosures for Barry Pulliam and Robin Deferrari	No Bates	No Bates
05/10/17	Laudeman Deposition Exhibits	Various	Various
05/25/17	Deferrari, Robin Deposition Exhibits	Various	Various
Various	North Dakota Production & Extraction Tax - Newfield Production T12 Form Request for all oil production activit	Newfield 11399	Newfield 11399
Various	North Dakota Production & Extraction Tax - Newfield Production T12 Form Request for all oil production activit	Newfield 11400	Newfield 11400
Various	North Dakota Production & Extraction Tax - Newfield Production T12 Form Request for all oil production activit	Newfield 11401	Newfield 11401
Various	North Dakota Production & Extraction Tax - Newfield Production T12 Form Request for all oil production activit	Newfield 11402	Newfield 11402
Various	Confidential 0001270-0001877	Eighty-Eight0001270	Eighty-Eight0001877
Various	Check Detail	Newfield 11417	Newfield 11652
02/12/16	January 2016 Invoice for Oil	Newfield 11653	Newfield 11653
04/23/10	Crude Oil Volume Commitment	Eighty-Eight0000164	Eighty-Eight0000170
04/28/10	Crude Oil Volume Commitment	Eighty-Eight0000171	Eighty-Eight0000178
04/29/10	Crude Oil Volume Commitment	Eighty-Eight0000179	Eighty-Eight0000187
04/28/10	Expression of Interest for Sale of Crude Oil	Eighty-Eight0000202	Eighty-Eight0000210
Various	"Daily Market Review" / Monthly Posting Averages	Eighty-Eight0000047	Eighty-Eight0000106
06/08/17	Deposition and Exhibits of Daniel Elliott Apland	No Bates	No Bates
07/29/14	Reuters Article "Pony Express oil pipe line-fill starts; shipments seen in Oct"	Public Document	
08/06/14	Reuters Article "Tallgrass sees Pony Express pipeline start up in September"	Public Document	
06/10/15	Genscape Article "Pony Express Pipeline Expansion Bucks Cushing Transportation Balance Trend"	Public Document	
9/25/215	BusinessWire Article "Tallgrass Pony Express Pipeline Announces Potential Expansion of Crude Oil Pipeline Syst	Public Document	
01/01/10	"A Brief History of Oil Production from the Bakken Formation in the Williston Basin" by Stephen Nordeng	Public Document	
10/01/12	COPAS Oil Accounting Manual AG6 Revised October 2012	Public Document	
	Argus - US Shale Oil Special Report 2012	Public Document	
	Argus - Rockies crude trading at Cushing	Public Document	
06/14/12	Bridger PL ND Gov Summit Presentation	Public Document	
	Crestwood (CMLP) 2014 Annual Report	Public Document	
2011	EIA Bakken Shale Map 2011	Public Document	
	Form T-12 Instructions	Public Document	
	Form T-12	Public Document	
	ND Monthly Oil Production Stats	Public Document	
	ICE ASCI Product Guide	Public Document	
	Investopedia "Mark To Market" (MTM) Definition	Public Document	
05/01/12	ND Oil & Gas Division Crude Gathering Map may-2012	Public Document	
09/01/13	ND Oil & Gas Division Crude Gathering Map sep-2013-data	Public Document	
06/01/17	ND Oil & Gas Division Major Oil PIpelines-june-2017	Public Document	
02/01/15	ND Pipeline Authority Rail Facilities feb-2015	Public Document	
	North Dakota Century Code (NDCC) t57c51	Public Document	
07/08/14	Market Realist Article "Must Know: Existing Crude Pipeline Systems in the Bakken	Public Document	

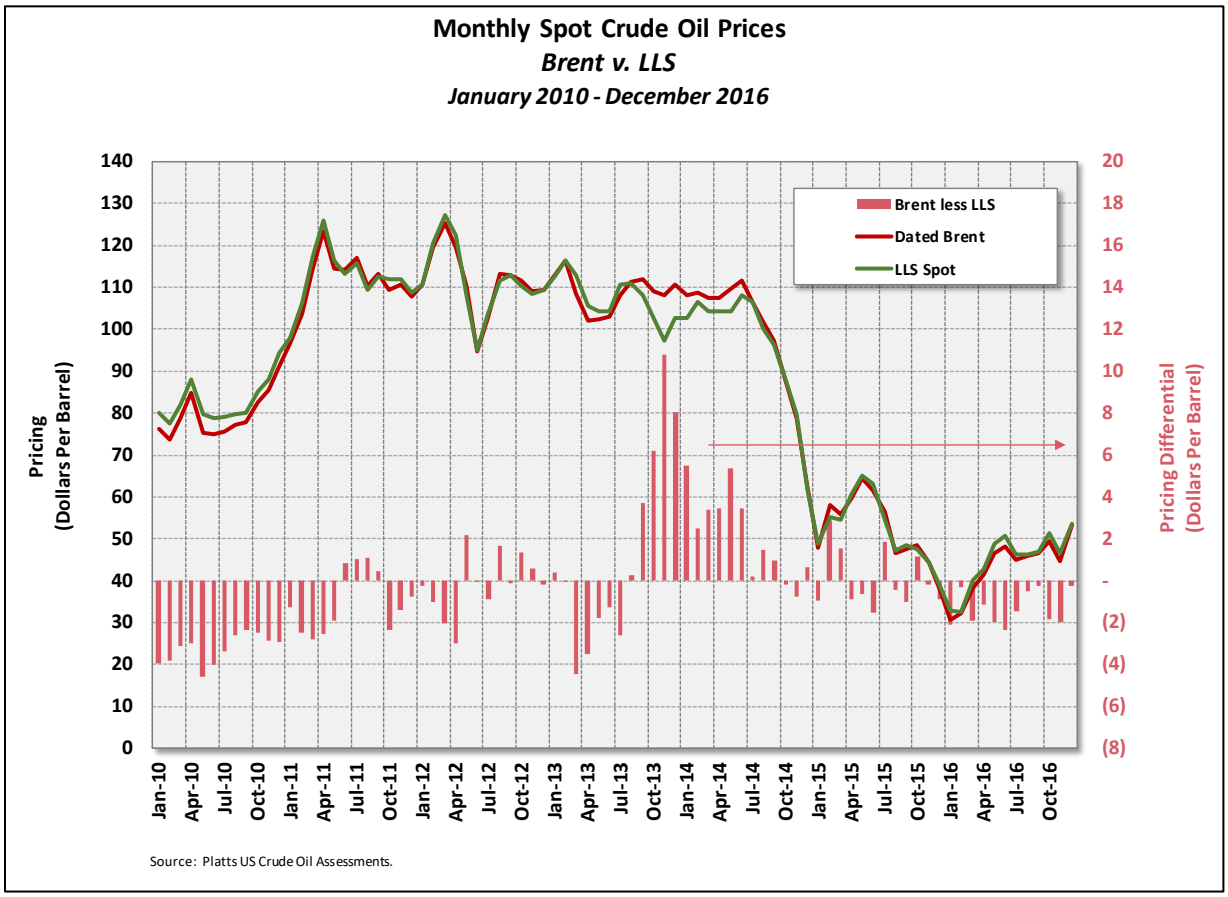
Appendix C
List of Documents Relied Upon

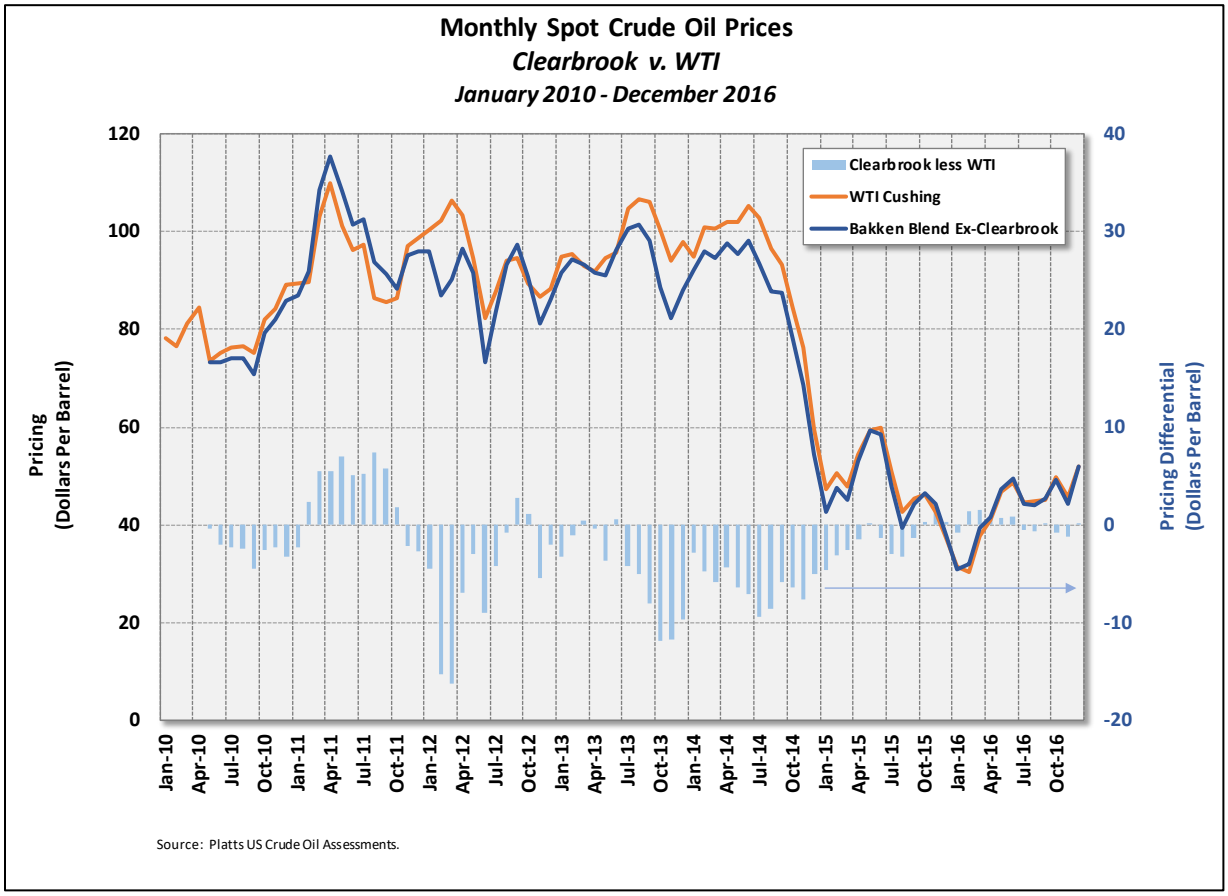
Date	Document	Beginning Bates	Ending Bates
	NDPA Newsletter V3I1 - March 2010 Four Bears Open Season Announcement	Public Document	
	ndpa-website-data93.xlsx	Public Document	
	ndpa-website-data98.xlsx	Public Document	
	NDPL-FERC-No-2-2-0	Public Document	
07/01/06	Ness Helms Whitepaper July 2006	Public Document	
	North Dakota Century Code t57c51	Public Document	
12/1/213	AAR - Moving Crude Oil by Rail	Public Document	
	Pony Express 30k bbl committed	Public Document	
	Pony Express Pipeline Map	Public Document	
	Dakota Plains Operations (www.dakotaplains.com)	Public Document	
03/03/13	RBN Energy "Crude Loves Rock 'n' Rail - Bakken Oil Express, Dakota Plains, BakkenLink, and Savage	Public Document	
09/09/13	Reconnecting US CO WIth GLobal Mkts Platts 9 SEPT 2013 KAUR	Public Document	
08/21/14	Tad True Testimony DOE QER Cheyenne 21 AUG 2014	Public Document	
	Weekly_Cushing_OK_Ending_Stocks_excluding_SPR_of_Crude_Oil.xlsx	Public Document	
	Weekly_Europe_Brent_Spot_Price_FOB.csv	Public Document	
10/01/15	GenScape-Crude-by-Rail-Evolves-Into-Permanent-Midstream-Fixture-Oct-2015.pdf	Public Document	
07/26/17	Merriam Webster Definition of "Market"	Public Document	
10/12/11	Director's Cut\directorscut-2011-10-12	Public Document	
01/17/12	Director's Cut\directorscut-2012-01-17	Public Document	
02/10/12	Director's Cut\directorscut-2012-02-10	Public Document	
03/21/12	Director's Cut\directorscut-2012-03-21	Public Document	
04/11/12	Director's Cut\directorscut-2012-04-11	Public Document	
05/25/12	Director's Cut\directorscut-2012-05-25	Public Document	
06/19/12	Director's Cut\directorscut-2012-06-19	Public Document	
	2010 Nov Enbridge Pipelines Order on Petition for Declaratory order	Public Document	
09/14/12	FERC Order Accepting Tariff Enbridge Pipeline (North Dakota)	Public Document	
04/23/13	Busting bottlenecks in the Bakken _ Federal Reserve Bank of Minneapolis	Public Document	
04/01/12	NDPA Publication-april-2012-ndpa-monthly-update	Public Document	
05/01/12	NDPA Publication-may-2012-monthly-update1	Public Document	
05/01/13	NDPA Publication-may-2013-monthly-update1	Public Document	
12/01/10	NDPA Publication-NDPA Dec 2010 Oil Report	Public Document	
08/18/11	NDPA Publication-NDPA EDT 8-18-2011 Full Page	Public Document	
06/11/12	Musket News Release "Musket Corporation completes MajorExpansion in the Bakken Shale/Williston Basi Regi	Public Document	
11/01/11	NDPA Publication-NDPA Newsletter V4I3 - November 2011	Public Document	
	NDPA Publication-newsletter-v1i1	Public Document	
	NDPA Publication-newsletter-v1i2	Public Document	
10/01/12	NDPA Publication-october-2012-monthly-update1	Public Document	
01/03/00	2011.11 - Flint Hills Price Bulletin	Public Document	
	Van Hook, North Dakota Crude Oil Origination Terminal (http://usdg.com/terminal/van-hook/)	Public Document	
11/01/11	2011.11 - Plains Price Bulletin	Public Document	
11/01/11	2011.11 - STUSCO Price Bulletins	Public Document	
May 2015	2015.05 - Plains Price Bulletin (last publication for N. Dakota)	Public Document	
2017	2017 - Flint Hills Gravity Adj Scale	Public Document	
June 2017	2017.06 - STUSCO Price Bulletins	Public Document	
July 2017	2017.07 - Flint Hills Price Bulletin	Public Document	
09/26/12	New oil pipelines, price bottlenecks and how Cushing, Okla	Public Document	
03/19/13	EIA Today Bakken crude oil price differential to WTI narrows over last 14 months	Public Document	
01/22/14	TransCanada opens Gulf Coast line, breaking U.S oil bottleneck	Public Document	
03/26/15	Oklahoma Running Out of Room for Oil as U.S	Public Document	
05/19/12	Seaway pipeline sends oil to Texas in historic reversal _ Reuters	Public Document	
	A Light and Sweet Primer on Oil Prices and Price Differentials _ Energy Law Today	Public Document	
06/28/13	EIA - Price difference between Brent and WTI	Public Document	
02/24/11	EIA This Week In Petroleum	Public Document	
	Unlocking the Crude Oil Bottleneck at Cushing - Bloomberg	Public Document	
	WTI-Brent crude oil price spread Feb 28 2011 EIA Today in Energy	Public Document	
02/28/11	NDPA Rail Webinar Slides	Public Document	
12/31/11	Trinity Industries 10K	Public Document	
11/05/12	Rangeland Energy, LLC to Sell Large Crude Oil Rail Terminal	Public Document	
01/01/13	BMO Capital Markets Rail Transportation	Public Document	
01/08/13	Phillips 66 makes $1 bln commitment to ship Bakken cru	Public Document	
04/25/13	Shipping Crude Oil by Rail_ A Victim of its Own Success_	Public Document	
05/24/13	Moving crude by rail works for refiners - San Antonio Express-N	Public Document	
01/19/13	Jumping aboard the North Dakota oil-by-rail shipping boom - StarTribune	Public Document	
02/01/14	GATX Stifel Trans Conference	Public Document	
06/01/14	Crude By Rail Update, BMO	Public Document	
09/28/15	Bakken Crude by Rail	Public Document	

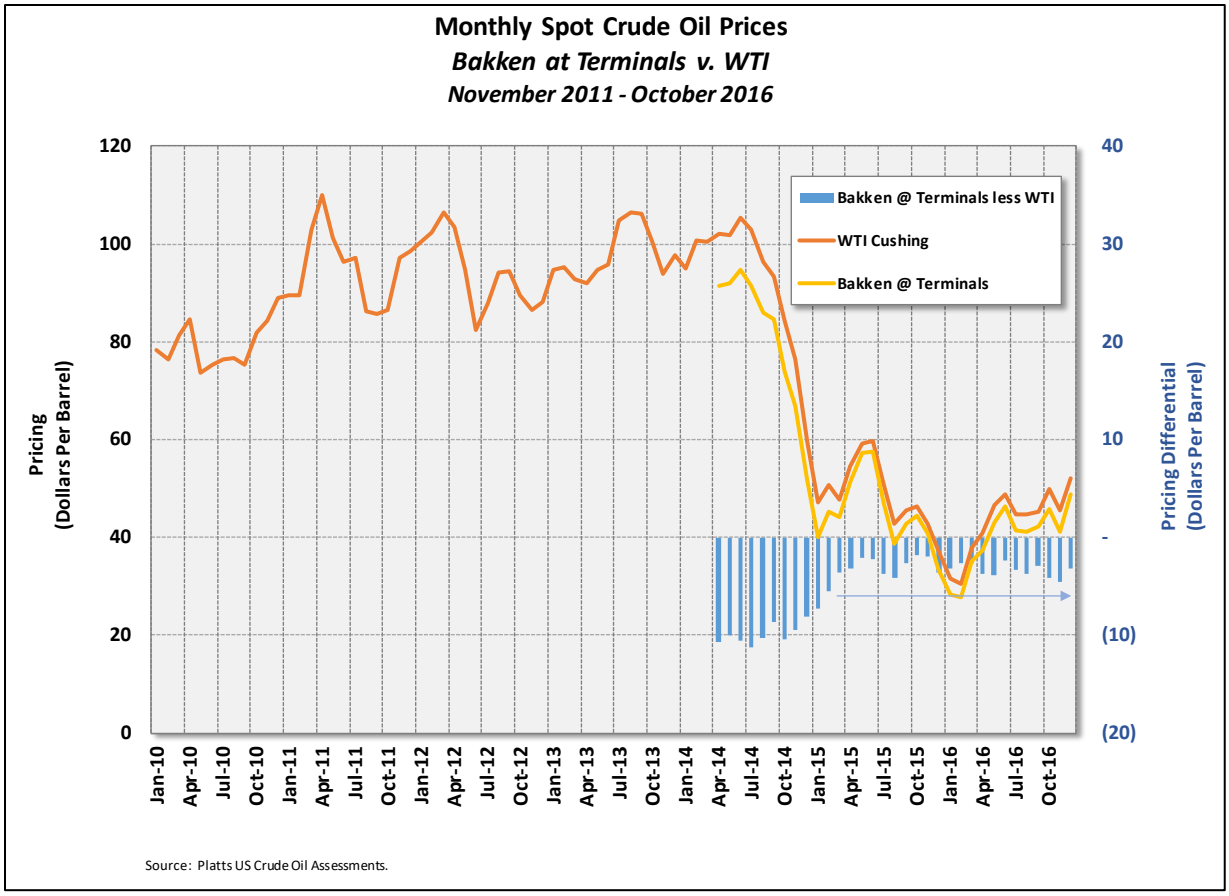
Appendix C
List of Documents Relied Upon

Date	Document	Beginning Bates	Ending Bates
	Transport Canada (http://www.tc.gc.ca/eng/menu.htm) - "Our Role"	Public Document	
11/01/15	Tracking Emissions, Crude by Rail	Public Document	
07/12/16	PetroRail_Report_Sample - Genscape	Public Document	
10/01/16	genscape_white_paper_dakota_access	Public Document	
06/30/17	PetroRail2017Sample (genscape)	Public Document	
	CRS U.S Rail Transportation of Crude R43390	Public Document	
	Keystone XL Supplemental EIS - Appendix C	Public Document	
	Keystone XL Supplemental EIS part	Public Document	
	May 2013 Moving Crude Oil by Rail	Public Document	
	Rail Regulatory\final-rule-flammable-liquids-by-rail_0	Public Document	
	Continental 030711 Fourth Quarter 2010 Update	Public Document	
03/06/14	2014 03.06 - RETAC Oil Update [ed].pptx	Public Document	
08/01/14	2014 08 - us_dot_regulation_sheds_light_on_crude_by_rail_traffic_white_paper	Public Document	
7/1/20014	2014.07 - AAR - Moving Crude by Rail	Public Document	
07/01/15	2015.07 - AAR - Moving Crude Oil Safely by Rail	Public Document	
	Genscape na_oil_petrorail_methodology_specifications	Public Document	
	OGJ - Rail emerging as long-term North American crude option	Public Document	
05/05/13	RBN - Crude Loves Rock'n'Rail - Brent, WTI and the Impact on Bakken N	Public Document	
07/08/13	RBN - Netback, Netback to Where You Started From - Bakken Crude Logistics	Public Document	
10/29/13	Bakken crude netbacks favor East and West coasts - Oil & Gas Fi	Public Document	
02/01/14	Genscape PetroRail Feb 2014	Public Document	
	Strobel-Energy-Group-Company-Profile-Spring-2017.pdf	Public Document	
03/01/15	Railroad Oil Shipping is Here to Stay	Public Document	
03/31/15	Petrorail_Report_033115	Public Document	
	_ND PL Auth - Market Share Chart Data 2010-2016.xlsx	Public Document	
	_US Williston Basin Oil Production _ ND Pipeline Authority	Public Document	
	Unsure\NDIC Oil & Gas Div\Well Index.xlsx	Public Document	
2013	Enbridge Inc. Annual Report	Public Document	
	North Dakota Pipeline Authority Annual Report July 2012 - June 2013	Public Document	
01/21/15	BusinessWire - Kinder Morgan to Acquire Premier Midstream Position in Bakken	Public Document	
	Kinder Morgan website - Double H Pipeline	Public Document	
01/27/12	Plains Announces New Bakken Area Gas Plant	Public Document	
06/01/16	Association of American Railroads "Timeline: Freight Rail Crude Oil by Rail Safety Actions"	Public Document	
06/01/17	North Dakota Pipeline Authority "US Williston Basin Crude Oil Export Options- 6/1/2017" (oil-table-6-1-171)	Public Document	
5/1/215	The Dickinson Press - "Refinery ramps up - Dakota Prairie Refining begins producing fuel"	Public Document	

APPENDIX D - HISTORICAL CRUDE OIL PRICES & DIFFERENTIALS




Monthly Spot Crude Oil Prices
Clearbrook v. WTI
January 2010 - December 2016
Pricing (Dollars Per Barrel)
Pricing Differential (Dollars Per Barrel)
Clearbrook less WTI
WTI Cushing
Bakken Blend Ex-Clearbrook
120
100
80
60
40
20
0
40
30
20
10
0
-10
-20
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Source: Platts US Crude Oil Assessments.


Monthly Spot Crude Oil Prices
Bakken at Terminals v. WTI
November 2011 - October 2016
Pricing (Dollars Per Barrel)
Pricing Differential (Dollars Per Barrel)
Bakken @ Terminals less WTI
WTI Cushing
Bakken @ Terminals
120
100
80
60
40
20
0
40
30
20
10
-
(10)
(20)
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
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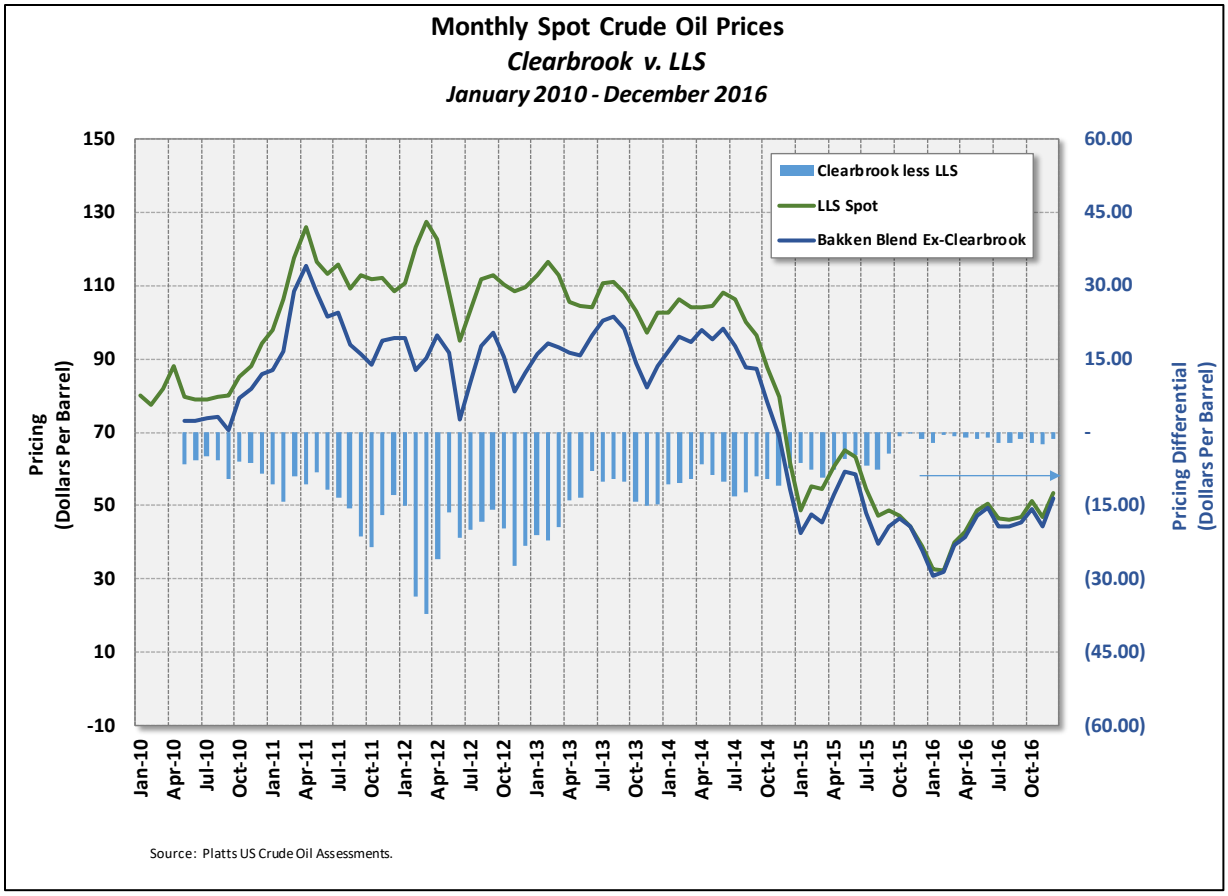
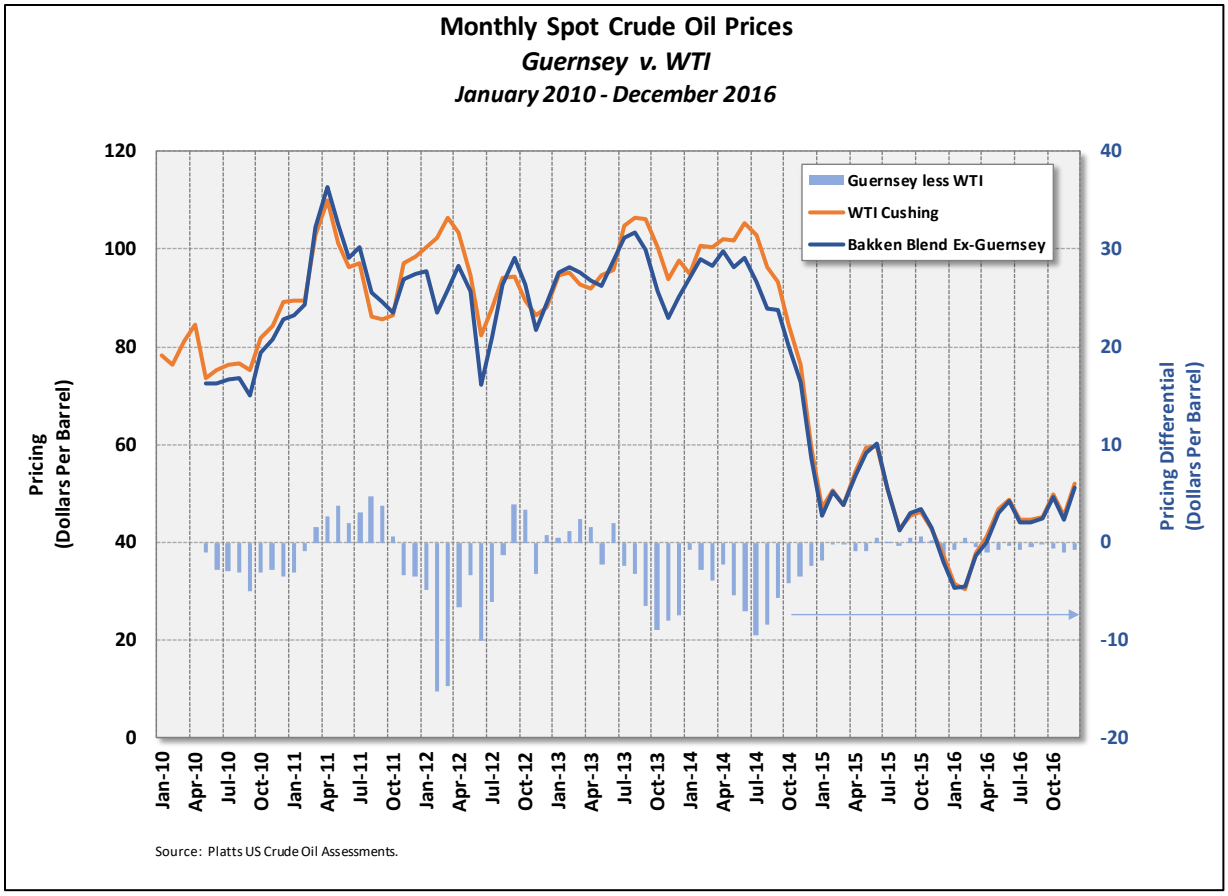
Apr-15
Jul-15
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Source: Platts US Crude Oil Assessments.



Source: Platts US Crude Oil Assessments.


Monthly Spot Crude Oil Prices
Guernsey v. WTI
January 2010 - December 2016
Pricing (Dollars Per Barrel)
Pricing Differential (Dollars Per Barrel)
Guernsey less WTI
WTI Cushing
Bakken Blend Ex-Guernsey
120
100
80
60
40
20
0
40
30
20
10
0
-10
-20
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
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Jan-14
Apr-14
Jul-14
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Apr-15
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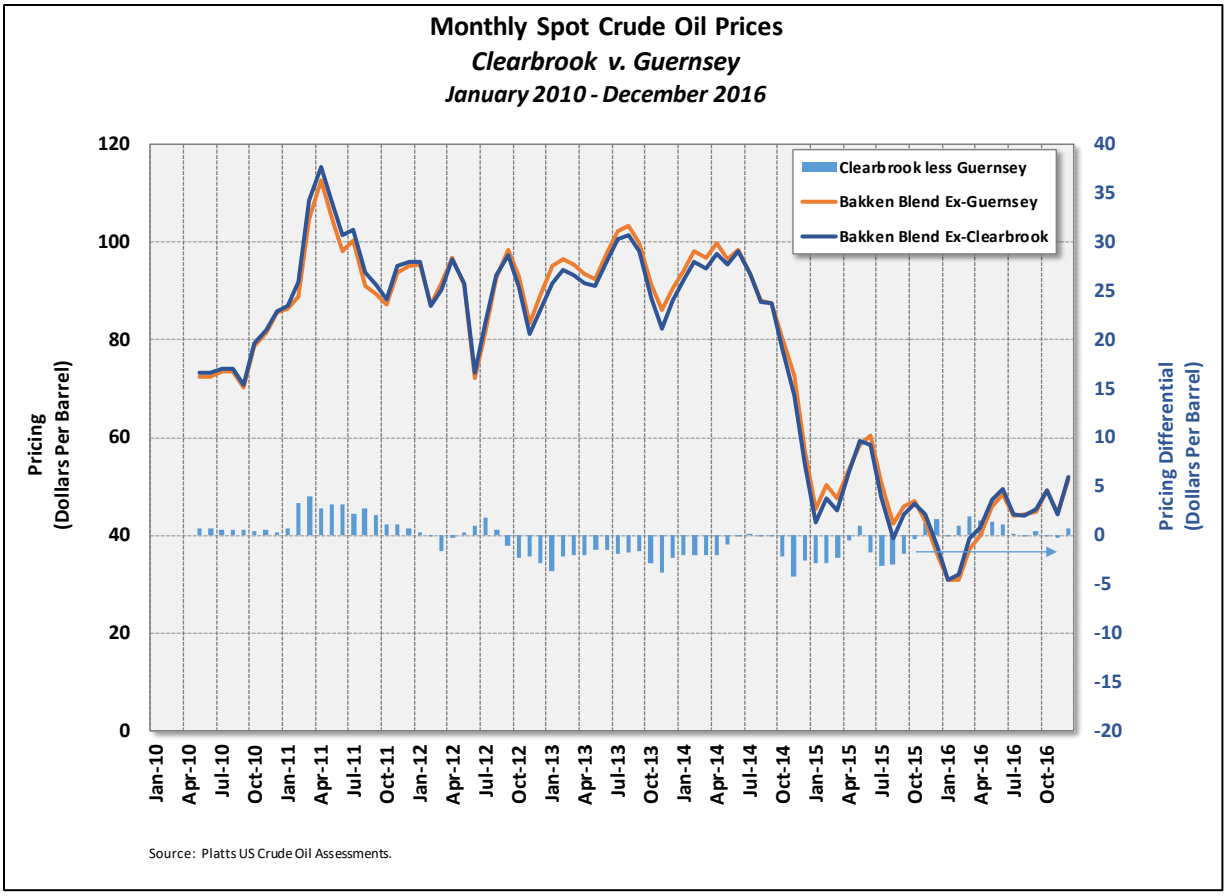
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Source: Platts US Crude Oil Assessments.


Monthly Spot Crude Oil Prices
Clearbrook v. Guernsey
January 2010 - December 2016
Pricing (Dollars Per Barrel)
Pricing Differential (Dollars Per Barrel)
Clearbrook less Guernsey
Bakken Blend Ex-Guernsey
Bakken Blend Ex-Clearbrook
120
100
80
60
40
20
0
40
35
30
25
20
15
10
5
0
-5
-10
-15
-20
Jan-10
Apr-10
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Jan-14
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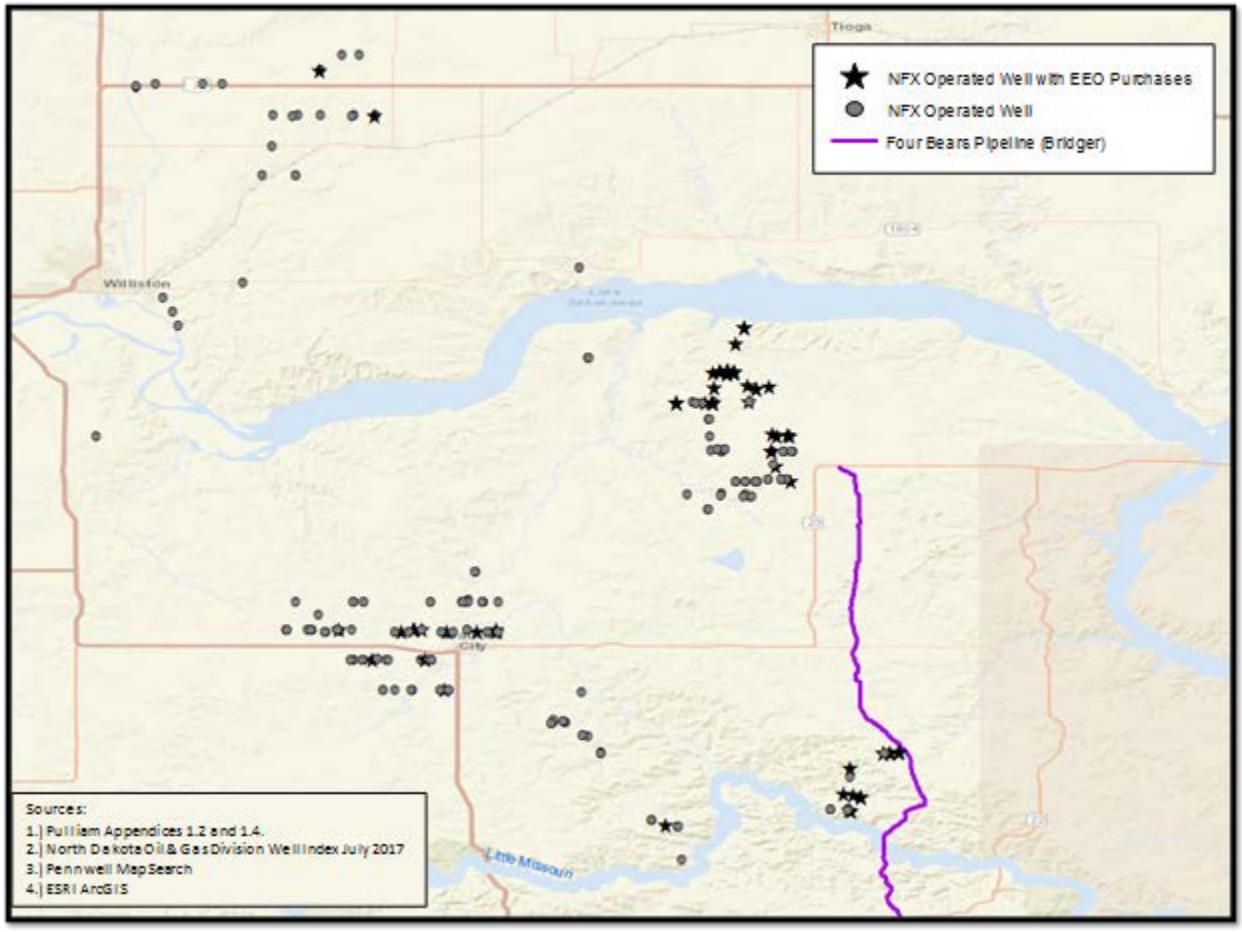
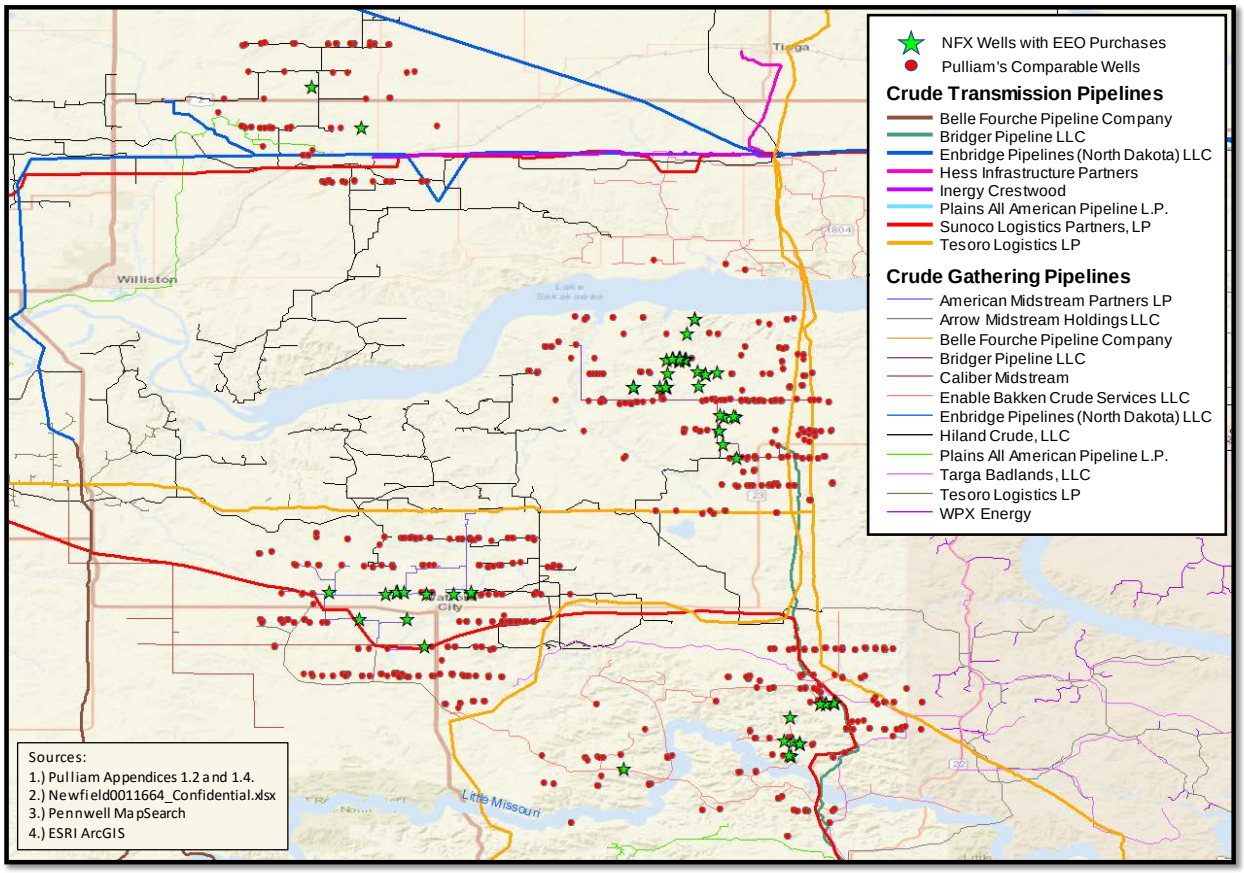
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Source: Platts US Crude Oil Assessments.

APPENDIX E - MAPS

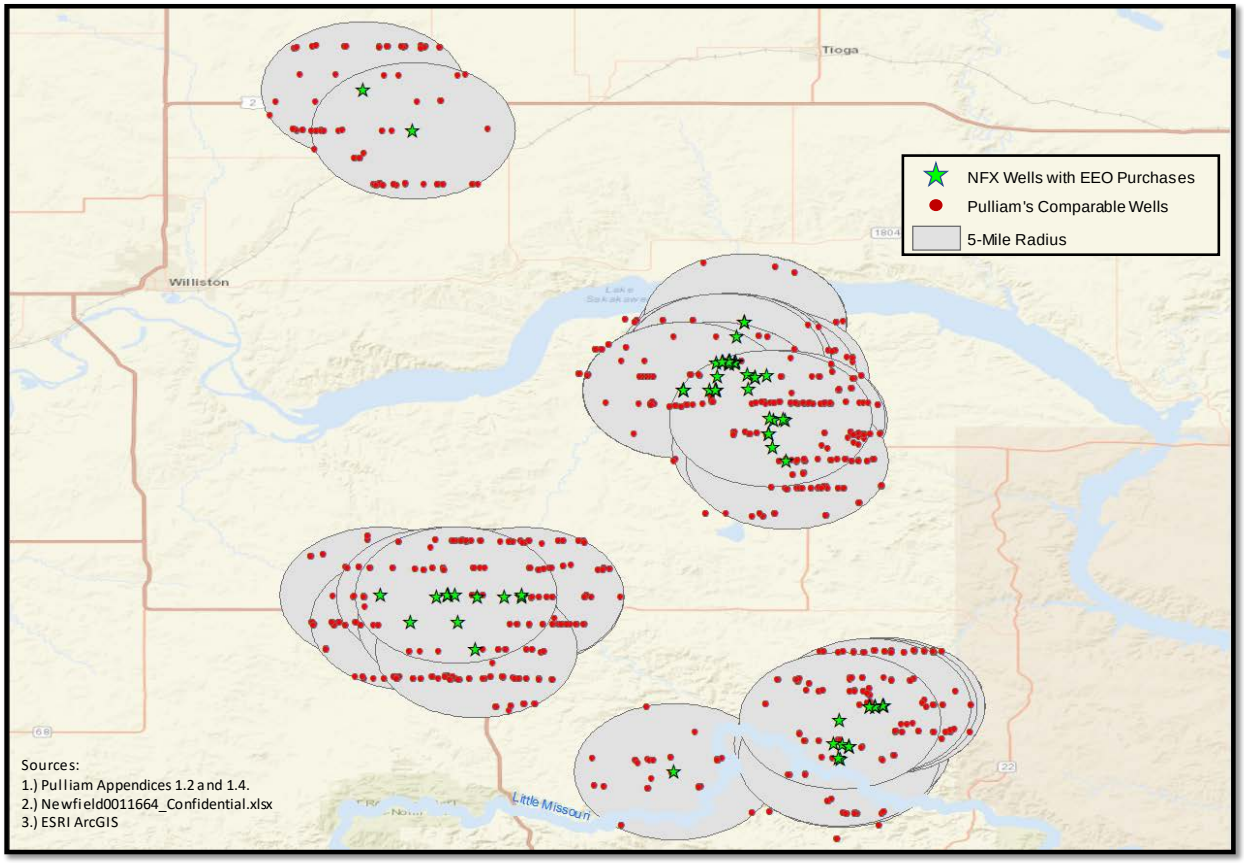
Newfield Operated Wells



Pipelines and Well Locations



Well Locations with 5-Mile Radius



Pipelines and Well Locations with 5-mile Radius